EPA, DTSC, and CDPH reviews (December, 2017) of the Navy's Draft
Parcel B portion of the Radiological Data Evaluation Findings Report Draft (September, 2017)
Hunters Point Naval Shipyard, San Francisco, California

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Below is an explanation of the contents of the individual spreadsheets in this workbook

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- 4 Count of trench units that showed certain types of examples of concerns
- 5 Fill units that received soil from trench units recommended for resampling
- 6 CDPH and EPA detailed review of 5 fill units that did not receive from trench units recommended for resampling
- 7 For each trench unit, this sheet shows only the columns with narrative summary of signs of falsification and signs of failure to follow the work plan (which can raise data quality concerns, even if no sign of falsification is observed)
- 8 Simplifed version of Spreadsheet #7 that shows only the score
- 9 CDPH review of building site survey units

Comments - Other 1) Significant data quality problems, indicated by the following:	Followup needed, e.g. questions for Navy	See addition statistical ar
K-40 and Cs-137 had the lowest mean results of any TU in Parcels B & D-2 Multiple Cs-137 results at or below 0 2) TU contained sewer line that was connected to or downstream from radiologically impacted building 157	Navy should provide missing scan/gamma static data.	
1) Significant data quality problems, indicated by the following: K-40 had second lowest mean results of any TU in Parcels B & D-2 Multiple Cs-137 results at or below 0	Navy should provide missing scan/gamma static data.	
2) TU contained sewer line that was connected to or downstream from radiologically impacted building 157 1) Significant data quality problems, indicated by the following: Multiple Cs-137 results at or below 0 2) TU contained sewer line that was connected to or downstream from radiologically impacted building 140	Navy should provide missing scan/gamma static data.	
1) Significant data quality problems, indicated by the following: Multiple Cs-137 results at or below 0 2) TU contained sewer line that was connected to or downstream from radiologically impacted buildings 140 and 142	Navy should provide missing scan/gamma static data.	
1) Significant data quality problems, indicated by the following: Multiple Cs-137 results at or below 0 2) Offsite lab mass not reported for 6PBFS-005-115	Navy should provide missing scan/gamma static data.	
3) Two FSS samples have high Bi-214 outliers. 1) No confirmatory/biased samples collected for FSS 2) One Bi-214 result in FSS was below zero.		
3) Large range of K-40 values (2.778 - 19.527 pCi/g) 4) High static count recorded at 9,132 cpm compared to surrounding TUs. Offsite samples from Eberline Services are inconsistent with Ac-228 data from all TUs. 5) Pb-212 results were higher for TU006 than the average for Parcels B and D-2.	Navy should provide missing scan/gamma static data.	
1) Scan and static data not provided in RACR or SUPR 2) Names of samplers/surveyors not provided in the SUPR 3) 16 of 18 FSS sample results for Cs-137 were less than zero.	Navy should provide missing scan/gamma static data.	
1) Significant data quality problems, indicated by the following: Multiple Cs-137 results at or below 0 2) TU contained sewer line that was connected to or downstream from radiologically impacted buildings 140 and 130	Navy should provide missing scan/gamma static data.	
1) Significant data quality problems, indicated by the following: Multiple Cs-137 results at or below 0	Navy should provide missing scan/gamma static data.	
2) TU contained sewer line that was connected to or downstream from radiologically impacted buildings 140 and 130		
1) 11 samples recounted 7 months later. No explanation for this.	Navy should provide missing scan/gamma static data.	
	Navy should provide missing scan/gamma static data.	
 1) FSS Results for the thorium series included two negative Ac-228 results, Bi-212 at 0.47 pCi/g, and Tl-208 at 0. These concentrations do not indicate that the Th-232 decay chain is in equilibrium as would be expected for native soils. This data indicates there are data quality issues, and may also be associated with falsification of results. 2) Sample 6PBFS-013-29 counted onsite on 10/02/06, and recounted about 2 years later on 12/01/08 by offsite lab. 3) Fss-SYS, FSS-BIAS and RAS samples all collected on 9/25/2006 	1) Item 4 on the Data EvalForm states that gamma static counts ranged between 4960 and 5536 which is unusually narrow but is consistent with the gamma scan range, but not consistent with the analytical results. Please explain. 2) Sample 6PBFS-013-29 counted onsite on 10/02/06, and recounted about 2 years later on 12/01/08 by offsite lab.	
This TU014 was located downstream and/or was connected to a radiologically-impacted building (Bldg. 114), indicating a higher likelihood that the Sewer lines and trench were radiologically contaminated.	Navy should provide missing scan/gamma static data.	
1) The Data Eval Form 'Summary of Findings' Summary of Findings states "The mean results for Bi-212, Pb-212, and Ac-228 were all higher than average for Parcel B" The Bi-214 and Pb-214 mean results were also higher than average for Parcel B" 2) One Bi-214 result was negative and offsite and onsite analyses of samples 110 and 124 are not consistent. 3) Soil probably used as backfill on Parcel C.		
	Navy should provide missing scan/gamma static data.	
1) The Summary of Findings states "The K-S Test Flagged Pb-214, which was reported at higher concentrations than other survey units in Parcel B." A higher Pb-214 indicates elevated Ra-226 is present. The Data Eval Form does not state if the Pb-214 and Ra-226 results from the analysis were comparable. This information would provide insight into whether results in TU017 were falsified or not.	were collected on 11/28/2006. The static survey was approved on 3/6/2008 as indicated in Attachment 1 of the SUPR document. The highest count was recorded at 6.126 cpm for sample location 081. No signature from the site RSO was recorded on this survey." These statements are contradictory, stating the gamma static survey was approved on 3/6/08 but then stating the site RSO signature is missing. 2) The Summary of Findings states "The K-S Test Flagged Pb-214, which was reported at higher concentrations than other survey units in Parcel B." A higher Pb-214 indicates elevated Ra-226 is present. The Data Eval Form does not state if the Pb-214 and Ra-226 results from the analysis were comparable. This information would provide insight into whether results in TU017 were falsified or not. Can the Navy provide this information? 2) Where is the missing data and why. 1) The Data Evaluation Form Summary of Findings states "The K-S test flagged Pb-214, Ac-228, and Pb-121. These radionuclides, plus Bi-214 and Bi-212,	
Resample due to different collection dates for samples for on- and off-site labs and uncertainty due to multiple populations in K-40 data.	presented higher-than-average results in TU018 compared to the rest of Parcel B. High results are not considered to be evidence of potential data falsification." The reviewer notes, however, that elevated concentrations of Bi-214 and Pb-214 indicate the presence of elevated Ra-226, but the Data Evaluation Form does not state if comparable Ra-226 results were reported and if so, if these levels exceeded the release criteria. Elevated levels of Bi-212 and Ac-228 indicate elevated concentrations of Th-232, however the Data Evaluation Form has not stated if this is the case or if the data are deemed to be anomalous. Further investigation by the Navy is needed.	
Form notes, "Ac-228 mean result is the lowest of all TUs in Parcels B & D-2 Bi-214 mean result is 3rd lowest of TUs in Parcels B & D-2 K-40 mean result is 3rd lowest of TUs in Parcels B & D-2 Pb-212 mean result is 3rd lowest of TUs in Parcels B & D-2 Pb-214 mean result is the lowest of all TUs in Parcels B & D-2. " Form concludes these are within the expected ranges.	The Data Evaluation Form states "[N]o direct comparison could be made between onsite and offsite data." The reviewer requests the Navy provide clarification regarding this statement.	
 TU0021 contained the sewer line that was connected to or downstream from the radiologically-impacted Building 103. Section II, Item 2 of the Data Evaluation Form states "Final Systematic samples from this TU contain low mean concentrations of Bi-214, K-40, Pb-212, and Pb-214 compared to other TUs in Parcels B & D02. In addition, the fact that TU020 and TU021 were sampled on the same day likely resulted in the disparity between Units and Days flags. Section II, item 2 of the Data Evaluation Form states that a review of the Ra-226 data shows that the Ra-226 concentrations in several samples have large negative values and are "apparently statistically indistinguishable from the remediation action level." The reviewer notes that large negative values of the Ra-26 data indicates a data quality issue and therefore such data is not reliable for decision making/demonstrating the ROD criteria has been met. 	Reviewer requests further clarification	
As in all other TUs, significant data quality issues exist, making the data unreliable for decision making and in demonstrating compliance with the ROD release criteria.		
FSS samples could have been substituted in 2010 when recounted 3 years after collection. Recommend resampling due to low variability Bi-214 and uncertainty about recounted samples.		
Recommend resampling due to uncertainty - different sample masses, low variability for Bi-214		
Some uncertainty because samples counted over 4 years. 2010 counts may be due to recounting at request of Navy or CDPH Several Final Systematic Bi-214 samples present as outliers FSS samples excluding #2 and #3 were counted onsite from 11/07/2006 to 11/09/2006. FSS samples #2 and #3 were counted on 09/21/2010. Sample #16 was counted offsite on 11/25/2008.		
Single set of FSS_SYS samples suggests falsification less likely; work done in 2006.		
Resample due to low Bi-214 FSS_SYS variability, evidence of multiple data sets.		

Resample due to different weights for on-site/off-site lab samples, indications of different populations for Bi-214, K-40, and Ac-228, and low variability and evidence of different populations for Bi-214, Ac-228, and K-40.	
1. FSS_SYS Samples counted on 4 days, and not sequentially. Form notes: " • FSS sample (132) analyzed on 07/14/2007 • FSS samples (117, 121, 122, 126, 127, 129, 131, and 134) analyzed on 07/17/2007 • FSS samples (118, 133, 120, 124, 123, 125, 128, and 130) analyzed on 07/18/2007. • FSS samples (119) analyzed on 07/19/2007." 2. Resample due to samples being counted on 4 different days and not sequentially (suggests potential for sample substitution), FSS_Bias having lower variability than FSS_SYS for Ac-228, Bi-214, and K-40, and evidence of different populations between data sets on Q-Q plots.	
Resample due to sample counting over 1 week (potential for substitution), different weights between on-site and off-site lab, large difference in 1 Ac-228 result, and evidence of different populations on Q-Q plots.	
Resample due to FSS sample counting over 6 days (potential for substitution), significant differences between on-site and off-site sample weights (not clear the same samples were counted), and the evidence for multiple populations based on the K-40 Q-Q plot.	
Resample due to multiple populations for Bi-214, Ac-228, and K-40 and counting 2 FSS_Bias samples much later (suggests substitution).	
Resample due to multiple populations for K-40 and possibly B-214 and because one FSS_Bias sample was counted on a completely different day than the others (which were not counted within 2 days of collection). These indicate possible sample substitution	
Resample due to multiple populations for K-40 and probably for Ac-228 and Bi-214, and because 2 samples were analyzed on a different das, suggesting potential substitution. FSS_Bias samples, which Q-Q plots indicate are a different population were counted 24 days after collection.	
Resample due to potential substitution - samples were counted over 12 days according to the form, but only one sample was analyzed on some days. Also, there is little variability for Bi-214 and evidence of multiple populations.	
 TU49 modified after 5 rounds of excavation and sampling to move contaminated area to TU 50. Resample due to low variability gamma statics, which were inconsistent with FSS data, as well as low variability FSS_SYS data for Bi-214, Ac-228, Cs-137 and low variability FSS_Bias for K-40. 	
1. Resample due to low variability gamma static data set that was inconsistent with scan data and the FSS data set and inconsistency between gamma scan and FSS data set. Also, low variability of B-214, AC-228, K-40 FSS_Bias samples suggests these are not related to the gamma scan data.	
Resample due to low variability gamma static data set that was inconsistent with scan data and the FSS data set and inconsistency between gamma scan and FSS data set. Also, there are multiple populations for K-40.	
 After 23 rounds of excavation and sampling, the Ra-226 contaminated portion of the trench became a new trench unit, TU 051A, but it is unclear if all of the Ra-226 contamination was in the area that became TU 051A from the beginning. Form notes about dates FSS_SYS samples were collected, "FSS samples 6PBFS-051-334, -335, -337 through -340, -345 through -351 were collected on 02/18/2008. Samples -336, -341 through -344 were collected on 02/19/2008." Although the Form concludes this is not evidence of falsification, it could be, particularly, since sample 336 was collected out of sequence. Resample due to inconsistent gamma scan and gamma static data, low variability gamma static data, evidence that there are different populations (low variability Ac-228 and Bi-214 FSS_SYS), and potential falsification associated with sampling over multiple days. 	
 This TU was split from TU 051 after it underwent 23 rounds of excavation and sampling; 9 more round of excavation and sampling conducted on TU 051A (for a total of 32). One FSS_SYS sample collected 2 days after the others. Resample due to inconsistent gamma scan/static data with FSS data set, low variability Bi-214, Ac-228, and K-40 FSS samples, and collection of one FSS_SYS sample 2 days after collection of the others - possible substitution. 	
1. Appears off-site lab had trouble with Ac-228 analysis.	
 Resample due to low variability of FSS_SYS and FSS_Bias for Bi-214, apparent different population for K-40 FSS_Bias, and inconsistent off-site lab results. 1 out of 7 off-site lab samples had inconsistent weight with the on-site lab samples, which may be an indication of falsification. Resample due to inconsistent weight of one off-site lab sample, low variability FSS_SYS for Bi-214 and K-40, apparent different population of K-40 characterization samples. Resample due to low variability of FSS_SYS for Ac-228 and Bi-214 and FSS_Bias for Bi-214 and Cs-137 and inconsistent 	
gamma statics. 1. Resample due to low variability and inconsistent K-40 samples, inconsistent off-site lab results.	EPA Statistician perform more detailed statistic analysis included
 Resample due to gamma scan and static data inconsistency with FSS lab data, multiple populations for K-40, and low variability Bi-214 FSS data. 	separately
1. Resample due to different weights for on- and off-site lab and counting of samples at off-site lab over a year later, suggesting possible sample substitution; inconsistent results between off-site and on-site lab; and low variability in Bi-214 FSS_SYS data set.	
 Resample due to uncertainty. FSS_SYS samples collected on two days but show significantly different results, suggesting 	
different populations. FSS_Bias samples for K-40 and Bi-214 have lower variability than FSS_SYS. Also, gamma static max is a bit low.	·
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different populations. FSS_Bias samples for K-40 and Bi-214 have lower variability than FSS_SYS. Also, gamma static max is a bit low.	more detailed statistic analysis included
different populations. FSS_Bias samples for K-40 and Bi-214 have lower variability than FSS_SYS. Also, gamma static max is a bit low. 1. Multiple populations do not necessarily indicate falsification.	more detailed statistic analysis included
different populations. FSS_Bias samples for K-40 and Bi-214 have lower variability than FSS_SYS. Also, gamma static max is a bit low. 1. Multiple populations do not necessarily indicate falsification. 1. DON had one sample recounted as part of a quality review.	more detailed statistic analysis included
1. Multiple populations do not necessarily indicate falsification. 1. DON had one sample recounted as part of a quality review. 1. Resample due to inconsistent gamma scan and gamma statics, low variability Bi-214 FSS_SYS. 1. Resample due to apparent different populations of K-40 between FSS_SYS and FSS_Bias, low variability of Ac-228 and Bi-214 FSS_SYS and FSS_Bias.	more detailed statistic analysis included
different populations. FSS_Bias samples for K-40 and Bi-214 have lower variability than FSS_SYS. Also, gamma static max is a bit low. 1. Multiple populations do not necessarily indicate falsification. 1. DON had one sample recounted as part of a quality review. 1. Resample due to inconsistent gamma scan and gamma statics, low variability Bi-214 FSS_SYS. 1. Resample due to apparent different populations of K-40 between FSS_SYS and FSS_Bias, low variability of Ac-228 and Bi-214 FSS_SYS and FSS_Bias. 1. Multiple flags for K-S test (compared to results from B and D-2). Ac-228 mean 7th lowest. K-40 mean 7th highest. Bi-212 mean is 7th lowest. Pb-212 is 12th lowest. 2. Resample due to unusually consistent gamma static and gamma scan data, low variability FSS_SYS and FSS_Bias for Ac-228	more detailed statistic analysis included
1. Multiple populations do not necessarily indicate falsification. 1. DON had one sample recounted as part of a quality review. 1. Resample due to inconsistent gamma scan and gamma statics, low variability Bi-214 FSS_SYS. 1. Resample due to apparent different populations of K-40 between FSS_SYS and FSS_Bias, low variability of Ac-228 and Bi-214 FSS_SYS and FSS_Bias. 1. Multiple flags for K-5 test (compared to results from B and D-2). Ac-228 mean 7th lowest. K-40 mean 7th highest. Bi-212 mean is 7th lowest. Pb-212 is 12th lowest. 2. Resample due to unusually consistent gamma static and gamma scan data, low variability FSS_SYS and FSS_Bias for Ac-228 and Bi-214 and K-40 FSS_SYS, and the potential that the K-40 sample indicate different sources.	more detailed statistic analysis included
different populations. FSS_Bias samples for K-40 and Bi-214 have lower variability than FSS_SYS. Also, gamma static max is a bit low. 1. Multiple populations do not necessarily indicate falsification. 1. DON had one sample recounted as part of a quality review. 1. Resample due to inconsistent gamma scan and gamma statics, low variability Bi-214 FSS_SYS. 1. Resample due to apparent different populations of K-40 between FSS_SYS and FSS_Bias, low variability of Ac-228 and Bi-214 FSS_SYS and FSS_Bias. 1. Multiple flags for K-S test (compared to results from B and D-2). Ac-228 mean 7th lowest. K-40 mean 7th highest. Bi-212 mean is 7th lowest. Pb-212 is 12th lowest. 2. Resample due to unusually consistent gamma static and gamma scan data, low variability FSS_SYS and FSS_Bias for Ac-228 and Bi-214 and K-40 FSS_SYS, and the potential that the K-40 sample indicate different sources. 1. Resample due to unusually consistent gamma scan and gamma static data ranges, failure to collect bias samples when there were gamma scan and gamma static exceedences, multiple populations in FSS_SYS data for Ac-228, Bi-214, K-40.	more detailed statistic analysis included

Summary of FPA review of Parcel B Trench Units

bullillary of EPA rev	view of Parcei B Trench Ui	III.5
Number of TU's	% of Parcel B total	
70	100%	Total trench units in Parcel B
Navy reviewed 70 to	tal Trench Units to look fo	or signs of potential falsification
2	3%	Navy recommended confirmation sampling due to signs of potential falsification
2	3%	Navy recommended reanalysis of archived samples
66	94%	Navy recommended NFA = No further action due to signs of falsification, but potential further action due to uncertainty
EPA reviewed the 66	Trench Units recommend	led for NFA
15	21%	EPA score 0 = No specific findings of particular concern
0	0%	EPA Score 1 = Need further review
51	73%	EPA Score 2 = Need resampling before determination that the record supports ROD requirements met
0	0%	Not yet reviewed
Γotal Navy and EPA	recommend for resamplin	ng
E2	760/	

Trench Unit	Overall score (0,1, or 2)
TU015	0
TU022	0
TU025	0
TU026	0
TU027	0
TU028	0
TU029	0
TU030	0
TU033	0
TU036	0
TU041	0
TU052	0
TU062	0
TU063	0
TU064	0
TU001	2
TU002	2
TU003	2
TU004	2
TU005	2
TU006	2
TU007	2
TU008	2
TU009	2
TU010	2
TU011	2
TU012	2
TU013	2
TU014	2
TU016	2
TU017	2
TU018	2
TU019	2
TU020	2
TU021	2
TU023	2
TU024	2
TU037	2
TU039	2
TU040	2
TU042	2
TU043	2
TU044	2
TU045	2
TU046	2
TU047	2
TU048	2
TU049	2
TU050	2
TU050A	2
TU051	2
TU051A	2
TU053	2
TU054	2
TU055	2
TU056	2
TU058	2
TU060	2
TU061	2
TU065	2
TU125	2
TU126	2
TU127	2
TU128	2
TU131	2
TU186	2

EPA, CDPH, and DTSC review of Parcel B Rad Data Evaluation

	Trench	Fill	Building Sites	Total	% of total
Tota Survey Units in Parcel B	70	112	17	199	100%
Navy recommended resampling	2	18	9	29	15%
Navy recommended reanalyzing archived samples	2	1	0	3	2%
EPA, CDPH, DTSC recommend resampling	55	89	7	151	76%
Total recommended resampling	57	107	16	180	90%
No signs of falsification found in data	13	5	1	19	10%
Regulators not yet reviewed	0	0	0	0	0%
% of total recommended resampling	81%	96%	94%	90%	

The above was for Parcel B alone. Below is for entire Shipyard.

Total Survey Units in Hunters Pt Tetra Tech EC	305	514	*
Parcel B as % of total	23%	22%	*

^{*} Parcel B has 7 former building sites, which is 21% of the total 34. The above chart shows survey units at building sites. The number of survey units at building sites for the entire site was not available.

Parcel B Examples of issues and their prevalence

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	Trench Unit	No gamma static and scan	Weight difference	>=2 results Zero or negative			
Total	66	16	5	30	0	0	(
% of total	100%	24%	8%	45%	0%	0%	0
	TU001	1		1			
	TU002	1		1			
	TU003 TU004	1		1 1			
	TU005	1		1			
	TU006	1		1			
	TU007	1	1	1			
	TU008	1					
	TU009	1					
	TU010						
	TU011	1		1			
	TU012 TU013	1 1		1 1			
	TU013	1		1			
	TU015	_					
	TU016	1					
	TU017						
	TU018			1			
	TU019	1	1	1			
	TU020 TU021	1		1 1			
	TU021			1			
	TU023			1			
	TU024			1			
	TU025						
	TU026						
	TU027						
	TU028 TU029			1			
	TU030						
	TU033						
	TU036			1			
	TU037						
	TU039			1			
	TU040		1	1			
	TU041 TU042			1			
	TU042			1			
	TU044		1				
	TU045			1			
	TU046						
	TU047						
	TU048						
	TU049 TU050			1			
	TU050A						
	TU051						
	TU051A						
	TU052						
	TU053			1			
	TU054			1			
	TU055 TU056			1			
	TU058			1 1			
	TU060		1	1			
	TU061			1			
	TU062						
	TU062						
	TU063						
	TU064			1			
	TU065 TU125			1			
	TU126			1			
	TU127						
	TU128						
	TU59		1				
	<u> </u>						

EPA and CDPH rev	riew of the 10 fill u	units that did not	t receive soil from trench units that were recommended for resampling											
Fill Unit	Overall score (0,1,	Reviewer	Box Plots Q-Q Plots	Rounds of excavation	Gamma scan or static concerns	On vs offsite lab	Time Series	Suspect name (1=yes, 0=no)	Name, if suspec	ect Name, if not suspect	Signs of falsifying (1=Yes, 0=no)	Signs of falsification summary	Failure to follow workplan (1=Y, 0=N)	Signs of failure to follow workplan Comments - Other CDPH Recommendation
OB098	2	NB, TJ, KB	Cs-137 - several low/negative results - indicating a data quality issue; Bi-214 low variability K-40 results indicate possible multiple populations, Ac -228 and Bi-214 may also multiple populations		1) Gamma static and scan results were not provided in the SUPR 2) Names of samplers/surveyors not provided in SUPR	2 FSS results from off-site lab at 0	None	(1-yes, 0-110)		ided Name(s) not provided		1) Gamma static data not provided in SUPR 2) Names of samplers/surveyors not provided in the SUPR 3) Name of scan/static surveyor not provided in the SUPR 4) Q Q Plots for FSS results for K-40 depict at leat two different data populations	1	Resample: Due to FSS sample (001) analyzed on 09/20/20 after the sample was collected. FSS samples (002 through 018) were analyzed on 10/04/20 (007) was analyzed by an offsite laboratory (Test/ Ar 2) Gamma static and scan surveyor is not listed in the SUPR 2 FSS results from off-site lab at 0 Two FSS samples (007 and 016) were counted by an offsite (Eberline) and the analysis date was not reported. (KB not 2010 was at the request of CDPH/EPA and does not indicated in the supplementary of the sample was collected. FSS samples (002 through 018) were analyzed on 10/04/20 (007) was analyzed by an offsite laboratory (Test/ Ar 2 FSS results from off-site lab at 0 2 FSS results from off-site lab at 0
OB117	2	NB, TJ, KB	Cs-137 - several low/negative results - indicating a data quality issue AC-228 and Bi-214 range indicates low variability K-40 results indicate possible multiple populations, Ac -228 and Bi-214 may also multiple populations		1) Gamma static and scan results were not provided in the SUPR 2) Names of samplers/surveyors not provided in SUPR 3) Timining of scan measurements not every 6 seconds as required in work plan, most 10 seconds, some 30 seconds apart. 4) More scan data collected than expected based on volume of soil.	3 samples differ, 2 BI214 greater than off-site lab and 1 Ra-226 less than off-site lab	. FSS Ac-228 result at or below below 0.		Name(s) not provi	ided Name(s) not provided	1	1) Gamma static data not provided in SUPR 2) Names of samplers/surveyors not provided in the SUPR 3) Name of scan/static surveyor not provided in the SUPR 4 Too much gamma scan data, but was collected every 10-30 seconds. This is very inconsistent	1	1) Gamma static and scan results were not provided in the SUPR 2) Gamma static and scan surveyor is not listed in the SUPR 10-30 seconds is a significant discrepancy. NFA- not in indication of falsification but a data quality iss Inconsistent gamma scan data suggests potential that the surveyed as required in the work plan. Should res
OB147	2		Cs-137 - several low/negative results - indicating a data quality issue, and range indicates possible low variability; Bi-214 range very low variability. Form notes, "Low variance in all three nuclides plotted. High outlier for Bi-214." K-40 results indicate possible multiple populations, Ac -228 and Bi-214 may also multiple populations		1) Gamma static and scan results were not provided in the SUPR 2) Names of samplers/surveyors not provided in SUPR 3) Several 20 minute time gaps occurred. 4) Twice as many scan meaurements reported. 5) Form notes, " . Approximately 700 scan measurements were reported for OB147 (10 pages with approximately 66 results per page), which is twice as many results as generally reported for a complete fill unit. The extra data could result from the inconsistent timing of the individual measurements and multiple gaps in data, indicating potential instrument problems."	On-site lab - K-40 over estimated on two samples by 40-50%. Form notes,	2 FSS Ac-228 results at or below 0.		Name(s) not provi	ided Name(s) not provided	1	1) Gamma static data not provided in SUPR 2) Names of samplers/surveyors not provided in the SUPR 3) Name of scan/static surveyor not provided in the SUPR	1	1) Gamma static and scan results were not provided in the SUPR 2) Gamma static and scan surveyor is not listed in the SUPR 2) Gamma static and scan surveyor is not listed in the SUPR 2) Gamma static and scan surveyor is not listed in the SUPR 3) Inconsistent on site lab results Navy reviewer indicates all three nuclides results indicate low variability; however, results are similar to other NFA fill units. NFA- not in indication of falsification but a data quality issues, including gamma scan, on-site lab results are similar to other NFA fill units.
OB185	2	NB, TJ, KB	Cs-137 - several low/negative results - indicating a data quality issue. Low variability Bi-214. Form notes, "K-40 and Bi-214 results have low variance. High outlier for Bi-214." Ac-228 results indicate possible at least populations. Also K-40 and Bi-214 have breaks indicating multiple populations. notes, "K-40 and Bi-214 have more horiz than expected graphs (low variance). Ac results display characteristics of at least different data populations."	slope Form ontal 1 -228	1) Gamma static and scan results were not provided in the SUPR 2) Names of samplers/surveyors not provided in SUPR 3) Scans not conducted in 6-second intervals, several time gaps, gamma scan data collected prior to sample collection, more than twice as many scan measurements reported than required for this small fill unit	1) On-site lab - K-40 over estimated on two samples by 50-60% 2) Inconsistent onsite lab results	2 FSS Ac-228 results at or below 0.		Name(s) not provi	ided Name(s) not provided	1	2) Investigative data, and scan and static data not provided in RACR or SUPR 3) Names of samplers/surveyors not provided in the SUPR 4) Q Q Plots for FSS results depict at leat two different data populations for Ac-228.	1	1) Gamma static and scan results were not provided in the SUPR 2) Gamma static and scan surveyor is not listed in the SUPR 1) Inconsistent on site lab results Resample due to low variability Bi-214, gamma scan described in the SUPR
OB240	0	NB, TJ, KB	Cs-137 - several low/negative results - indicating a data quality issue; Bi-214 low variability, which was noted on the form. K-40 has slope breaks indicating multipopulations. Form notes, ": Bi-214 plot in horizontal, indicating low variability in results."	s near 1	Gamma static and scan results were not provided in the SUPR Names of samplers/surveyors not provided in SUPR	1) On-site lab - K-40 over estimated on two samples by 50%	2 FSS Ac-228 results at or below 0.		Name(s) not provi	ided Name(s) not provided	1	1) Gamma static data not provided in SUPR 2) Names of samplers/surveyors not provided in the SUPR 3) Name of scan/static surveyor not provided in the SUPR	1	1) Gamma static and scan results were not provided in the SUPR 2) Gamma static and scan surveyor is not listed in the SUPR Navy reviewer indicates Bi-214 results indicate low variability; however, results are similar to other NFA fill units. NFA- not in indication of falsification but a data quality for the surveyor is not listed in the SUPR
OB243	0	NB, TJ, KB	Cs-137 - several low/negative results - indicating a data quality issue; Bi-214, K-40 low variability K-40 FSS has a different slope than of radionulides FSS (includes negative values slope breaks indicating multiple popular Large range of K-40 results	s); has	Gamma static and scan results were not provided in the SUPR Names of samplers/surveyors not provided in SUPR	On-site lab - K-40 over estimated on two samples by 50-60% ap	Several sample AC-228 sample results pproaching 0 with one result less than 0.		Name(s) not provi	ided Name(s) not provided	1	1) Gamma static data not provided in SUPR 2) Names of samplers/surveyors not provided in the SUPR 3) Name of scan/static surveyor not provided in the SUPR	1	1) Gamma static and scan results were not provided in the SUPR Navy reviewer indicates Bi-214 and K-40 results indicate low variability; however, results are similar to other NFA fill units. NFA- not in indication of falsification but a data quality and the SUPR
OB244	0	NB, TJ, KB	Cs-137 results all low, with multiple negative results - indicating a data quality issue; K-40 and Bi-214 data have low variability. Form notes, "All three nuclides show an unusually small sample variance for all three sampling events." Bi-214 and K-40 results indicate low variable for an indicating meaning populations. Form notes, "Bi-214 and K-40 results indicate low variable for an indicating meaning meanin	ultiple O have 3	1) Gamma static and scan results were not provided in the SUPR 2) Names of samplers/surveyors not provided in SUPR 3) Scans not conducted in 6-second intervals, most 7-seconds and many as hig as 30 seconds apart. 4) 1 hour	1) On-site lab - K-40 over estimated on two samples by 35-45%	One AC-228 result less than 0		Name(s) not provi	ided Name(s) not provided	1	1) Gamma static data not provided in SUPR 2) Names of samplers/surveyors not provided in the SUPR 3) Name of scan/static surveyor not provided in the SUPR	1	1) Gamma static and scan results were not provided in the SUPR 2) Gamma static and scan surveyor is not listed in the SUPR Navy reviewer indicates all three nuclides results indicate an unusually small sample variance; Also, Bi-224 & K-40 Q-plot indicates low variability; however, results are similar to other NFA fill units. NFA- not in indication of falsification but a data quality small sample variance; Also, Bi-224 & K-40 Q-plot indicates low variability; however, results are similar to other NFA fill units.
OB245	0	NB, TJ, KB	Cs-137 - several low/negative results - indicating a data quality issue and range indicates low variability. Bi-214 and K-40 have low variability. K-40 results have a higher mean and a lower variability compared to the rest of Parcel B	•	1) Gamma static and scan results were not provided in the SUPR 2) Names of samplers/surveyors not provided in SUPR 3) Scans not conducted in 6-second intervals, most 7-seconds and many as high as 30 seconds apart.	On-site lab - K-40 over estimated on two samples by 40%	None		Name(s) not provi	ided Name(s) not provided	1	1) Gamma static data not provided in SUPR 2) Names of samplers/surveyors not provided in the SUPR 3) Name of scan/static surveyor not provided in the SUPR	1	1) Gamma static and scan results were not provided in the SUPR 2) Gamma static and scan surveyor is not listed in the SUPR Navy reviewer indicates Bi-214 an K-40 results indicatelow variance; Also, Bi- 224 and K-40 Q-plot indicates low variability; however, results are similar to other NFA fill units. NFA- not in indication of falsification but a data quantum of the support o
OB248	0	NB, TJ, KB	1) Cs-137 - several low/negative results - indicating a data quality issue 2) Bi-214 and K-40 results have unusually small variance Ac-228, Bi-214, and K-40 displays charact (slope breaks) of at least two sample populations.	1 7	1) Gamma static and scan results were not provided in the SUPR 2) Names of samplers/surveyors not provided in SUPR 3) Scans not conducted in 6-second intervals, most 7-seconds and many as high as 30 seconds apart.	On-site lab - K-40 over estimated on two samples by 50-60%	veral sample AC-228 sample results near or below 0.		Name(s) not provi	ided Name(s) not provided	1	1) Gamma static data not provided in SUPR 2) Names of samplers/surveyors not provided in the SUPR 3) Name of scan/static surveyor not provided in the SUPR	1	1) Gamma static and scan results were not provided in the SUPR 2) Gamma static and scan surveyor is not listed in the SUPR 2) Gamma static and scan surveyor is not listed in the SUPR 2) Gamma static and scan surveyor is not listed in the SUPR 3) When the static and scan surveyor is not listed in the SUPR 4) The static and scan surveyor is not listed in the SUPR 5) The static and scan surveyor is not listed in the SUPR 6) The static and scan surveyor is not listed in the SUPR 7) Sample populations; however, other similar Q-Plots were not identified as such. Also K-40 results have higher mean and a lower variability compared to the rest of Parcel B.
OB250	2	NB, TJ, KB	1) Cs-137 - several low/negative results - indicating a data quality issue and range indicates low variability 2) Bi-214 and K-40 have unusually small variance of FSS samples (low variability) 1) Bi-214 results indicate low variability 2 data has slope breaks indicating multipopulations	· I	1) Gamma static and scan results were not provided in the SUPR 2) Names of samplers/surveyors not provided in SUPR 3) Scans not conducted in 6-second intervals 4) twice as many scan measurements collected as required	bel	.) Two AC-228 results near 0, including 1 low 0 2) Form notes for K-40, " Low sample variability as compared to other systematic sample K-40 results."		Name(s) not provi	ided Name(s) not provided	1	1) Gamma static data not provided in SUPR 2) Names of samplers/surveyors not provided in the SUPR 3) Name of scan/static surveyor not provided in the SUPR	1	1) Gamma static and scan results were not provided in the SUPR 2) Gamma static and scan surveyor is not listed in the SUPR 2) Gamma static and scan surveyor is not listed in the SUPR Other NFA fill units. NFA- not in indication of falsification but a data qual KB: Resample due to low variability Bi-214, multiple population of the SUPR dataset and gamma scan inconsistencies (twice as many as expected with 7 to 30 seconds between measuremen seconds)

DTSC review of fill units and associated trench units

This spreadsheet shows which fill units contain soil received from trench units that were recommended for resampling by the Navy and/or regulatory agencies

Note that many fill units received fill from multiple trench unit sources

Parcel B FUs (NFA and Navy recommended for Resample	Associated Trench Unit	Navy Recommends confirmation sampling of the FU	Navy Recommends TU Confirmation Sampling (2=yes)	Reg Agencies Recommend TU Confirmation Sampling	Confirmationa Sampling Recommended (2=yes; 0=no)	Navy recommends resampling FU that went into this TU, therefore, all FUs that went into this TU must be resampled. (OB072, OB196)
OB045 OB013	TU004 TU005			2		
OB024 OB015	TU007 TU010			2 2	. 2	
OB016 OB004	TU010 TU011			2		
OB054 OB056	TU011 TU011			2	. 2	
OB065 OB050	TU011 TU012			2		
OB053 OB060	TU012 TU012			2 2		
OB069 OB055	TU012 TU013	2	2	2		
OB043 OB044	TU014 TU014			2 2	2	
OB087 OB075	TU014 TU019			2 2		
OB076 OB079	TU019 TU019			2		
OB080 OB041	TU019 TU020			2	. 2	
OB074 OB083	TU020 TU020			2	. 2	
	TU020 TU020			2	. 2	
OB090 OB091	TU020 TU020			2	. 2	
OB001 OB066	TU021 TU021			2	. 2	
OB071 OB072	TU021 TU021	2	2	2	2	
OB082 OB095 OB100	TU021 TU021 TU023			2 2 2	2	
OB100 OB102 OB108	TU023 TU023	2	2	2 2	2	
	TU023 TU023			2 2	. 2	
OB110	TU026 TU026			0	2	
OB114	TU026 TU027	2		0	2	Agencies revieved FU form for recommendation
	TU033 TU033			0	2	
OB138	TU033 TU033	2		0	2	
OB142	TU036 TU036	2	1	0	2	
OB146	TU036 TU039	2	1	0	2	
	TU039 TU039	2		2	. 2	
OB157 OB160	TU042 TU042			2		
OB161 OB169	TU042 TU042			2		
OB178 OB186	TU045 TU045	2	2	2		
OB188 OB194	TU046 TU047	2	2	2 2	. 2	
OB195 OB200	TU047 TU047			2	. 2	
	TU049 TU049			2	2	
OB211 OB196	TU049 TU050A	2	2	2	. 2	Navy recomm. Reanalysis of Archived Samples
OB202 OB143	TU050A TU051			2	2	
	TU051 TU051	2	2	2	2	
OB208 OB218	TU053 TU053			2	. 2	
OB049 OB104 OB204	TU054 TU054			2	. 2	
OB204 OB209 OB212	TU054 TU054 TU054			2 2	. 2	
ES170 ES173	TU055 TU055	2		2 2	. 2	
OB035 OB177	TU056 TU057	2	2	2		
OB206 OB219	TU057 TU057		2		2	
OB222 OB223	TU057 TU057		2		2	
OB085 OB224	TU058 TU058			2	. 2	
OB226	TU058 TU058			2	. 2	
OB230 OB231	TU058 TU058			2	. 2	
OB241 OB042	TU058 TU060			2		
OB046 OB062	TU060 TU060			2	. 2	
OB234 OB236	TU061 TU061			2 2		
OB147 OB185	TU062 TU062			0		Agencies revieved FU form for recommendation Agencies revieved FU form for recommendation
OB240 OB250	TU062 TU062			0		Agencies revieved FU form for recommendation Agencies revieved FU form for recommendation
OB243 OB244	TU063 TU063			0		Agencies revieved FU form for recommendation Agencies revieved FU form for recommendation
	TU063 TU063			0	0	Agencies revieved FU form for recommendation Agencies revieved FU form for recommendation
OB098 OB189	TU064 TU065			0 2	. 2	Agencies revieved FU form for recommendation
OB233	TU065 TU065			2	. 2	
OB213 ES335	TU128 TU186	2		2		
<u> </u>	10180	16			95.54	

This includes: 84 FUs from w/in TUs recommended by agencies for resampling + 5 following form reviews.

Trench	So even if a In addition,	concern has please note	hat a sign of falsifying or failure to follow the workplan (e.g. data quality problems) have been noted, if the level of concern is relatively low, it still may not result in a recommenda that these observations were made in the 43 trench units that the Navy had previously de oes not include the 20 trench units that the Navy has already recommended for resampling	tion for resai signated as "	mpling	
Unit	Overall score (0,1, or 2)	_	Signs of falsification summary 1) No Confirmatory/biased samples were collected with FSS	failure to follow workplan (1=Y, 0=N)	Signs of failure to follow workplan	Comments - Other 1) Significant data quality problems, indicated by the following:
TU001	2	1	2) K-40 and Cs-137 had the lowest mean results of any TU in Parcels B & D-2 3) Q Q Plots for FSS results for Ac-228, Bi-214, and K-40 depict at lead two different	1	1) Gamma static and scan results were not provided in the SUPR 2) Gamma static and scan surveyor is not listed in the SUPR 3) 34 investigative samples are not in the SUPR or RACR	K-40 and Cs-137 had the lowest mean results of any TU in Parcels B & D-2 Multiple Cs-137 results at or below 0
TU002	2	1	1) K-40 had second lowest mean results of any TU in Parcels B & D-2	1	Gamma static and scan results were not provided in the SUPR 2) Gamma static and scan surveyor is not listed in the	2) TU contained sewer line that was connected to or downstream from radiologically impacted buildin 1) Significant data quality problems, indicated by the following: K-40 had second lowest mean results of any TU in Parcels B & D-2 Multiple Cs-137 results at or below 0
			2) Q Q Plots for FSS results for Bi-214 depict at lead two different data populations 1) 16 of 18 FSS sample results for Cs-137 were less than zero.		SUPR 1) Gamma static and scan results were not provided in the SUPR	TU contained sewer line that was connected to or downstream from radiologically impacted buildin Significant data quality problems, indicated by the following:
TU003	2	1	1) 10 01 10 155 Sample results for est 157 were less than 2cro.	1	Gamma static and scan surveyor is not listed in the SUPR	Multiple Cs-137 results at or below 0 2) TU contained sewer line that was connected to or downstream from radiologically impacted buildin
TU004	2	1	No Confirmatory/biased samples were collected with FSS Investigative data (67 samples) not provided in RACR or SUPR	1	Gamma static and scan results were not provided in the SUPR 2) Gamma static and scan surveyor is not listed in the SUPR	 Significant data quality problems, indicated by the following: Multiple Cs-137 results at or below 0 TU contained sewer line that was connected to or downstream from radiologically impacted buildings 14
TUOOF			3) Q Q Plots for FSS results depict at lead two different data populations for Ac-228, K-40, and Bi-214 1) Two Bi-214 FSS results elevated compared to Ra-226 result reported.		Gamma static and scan results were not provided in the SUPR	1) Significant data quality problems, indicated by the following: Multiple Cs-137 results at or below 0
TU005	2	1	2) FSS results indicate at least two populations are present in Bi-214 data set.	1	Gamma static and scan surveyor is not listed in the SUPR	2) Offsite lab mass not reported for 6PBFS-005-115 3) Two FSS samples have high Bi-214 outliers. 1) No confirmatory/biased samples collected for FSS
TU006	2	1	1) One Bi-214 result in FSS reported at 0.	1	Gamma static and scan results were not provided in the SUPR 2) Gamma static and scan surveyor is not listed in the	2) One Bi-214 result in FSS was below zero. 3) Large range of K-40 values (2.778 - 19.527 pCi/g)
			2) Pb-212 results were higher for TU006 than the average for Parcels b and D-2.		SUPR	4) High static count recorded at 9,132 cpm compared to surrounding TUs. Offsite samples from Eberline S inconsistent with Ac-228 data from all TUs. 5) Pb-212 results were higher for TU006 than the average for Parcels B and D-2.
			Differences in recorded collection date for sample 10; reported sample masses for this sample were different with the offsite lab recording an unusually low mass. It appears the onsite and offsite lab did not analyze the same sample.			
			 2) Delayed counting of samples (12 and 14 through 18) of four days after collection. 3)Sample 10 had 2 collection dates, and reported sample masses were different between 		Gamma static and scan results were not provided in	1) Scan and static data not provided in RACR or SUPR
TU007	2	1	onsite and offsite lab. It appears the onsite and offsite labs did not count the same sample. 4) Delayed counting of samples (4 days). One sample was recounted in 2010 as part of a quality review.	1	the SUPR 2) Gamma static and scan surveyor is not listed in the SUPR	2) Names of samplers/surveyors not provided in the SUPR3) 16 of 18 FSS sample results for Cs-137 were less than zero.
			5) Several Ac-228 results at or below 0; outliers identified for Ac-228, Bi-214, K-40 indicating potential data quality issues and/or falsification			
			6) Highest count recorded was 9,132 cpm for location 004. 7) No confirmation/bias samples collected		Gamma static and scan results were not provided in	
TU008	2	1	1) Seven FSS samples have results at 0 based on offsite lab results.; eight samples have low activities when compared to TU009.	1	the SUPR 2) Gamma static and scan surveyor is not listed in the SUPR	1) Significant data quality problems, indicated by the following: Multiple Cs-137 results at or below 0 2) TU contained sewer line that was connected to or downstream from radiologically impacted buildings 14
TU009	2	1	1) Two samples counted one day. Remaining samples counted 3 days later.	1	Gamma static and scan results were not provided in the SUPR 2) Gamma static and scan surveyor is not listed in the	1) Significant data quality problems, indicated by the following: Multiple Cs-137 results at or below 0
			1) Form notes, "FSS samples (247 and 257) analyzed on 6/22/2007. • FSS samples (246, 251, 258, 250, 252, 256, 253, 254, 259, 261, 262, 255, and 260) analyzed on 6/23/2007.		SUPR 1) RSO Signature missing from Gamma Static and Scan Data.	2) TU contained sewer line that was connected to or downstream from radiologically impacted buildings 1-
TU010	2	1	• FSS samples (258 and 263) analyzed on 6/26/2007." Analysis of samples on different days suggests potential substitution.	1	2) All samples analyzed in June 2007 except for one analyzed on October 8, 2010 1) Gamma static and scan results were not provided in	
TU011	2	1	1) 11 samples counted 7 months later; potential for substitution.	1	the SUPR 2) Gamma static and scan surveyor is not listed in the SUPR	1) 11 samples recounted 7 months later. No explanation for this.
			1) Different populations for K-40, Ac-228 and very low variability for Bi-214 FSS data set.		Gamma static and scan results were not provided in the SUPR	
TU012	2	1		1	2) Gamma static and scan surveyor is not listed in the SUPR	
			 Box Pots and QQ plots of RAS results for Ac-228, Bi-214, and K-40 appear to be from a different population than other surveys Th-232 decay chain radionuclides are not in equilibrium in the FSS. 		Sampler/surveyor name not provided in Work Plan.	1) FSS Results for the thorium series included two negative Ac-228 results, Bi-212 at 0.47 pCi/g, and Tl-208 concentrations do not indicate that the Th-232 decay chain is in equilibrium as would be expected for native states.
TU013	2	1	3) The Data Eval Form states in Section 4 "Gamma static counts ranged between 4960 and 5536, an unusually narrow range for heterogeneous material. However, the gamma static counts are consistent with the gamma scan range, but are not consistent with the analytical results of the FSS dataset." The inconsistencies in the pattern of data ranges			indicates there are data quality issues, and may also be associated with falsification of results. 2) Sample 6PBFS-013-29 counted onsite on 10/02/06, and recounted about 2 years later on 12/01/08 by 3) Fss-SYS, FSS-BIAS and RAS samples all collected on 9/25/2006
			and lack of comparable results indicates falsification most likely occurred. 1) Ac-228, Bi-214, and K-40 all have extremely low variance in the FSS results. The unusual small variance in results can not be explained by any reasonable argument, therefore the reviewer believes this is an indication of falsification			
TU014	2	1	2) Missing scan and static data in SUPR, in addition to the noted lack of normal variability in the FSS results for Ac-228, Bi-214, and K-40 indicate the data may have been falsified. Additionally, TU014 underwent at least five excavations. The need to	1	Gamma static and scan surveyor is not listed in the SUPR No FSS Bias samples collected	This TU014 was located downstream and/or was connected to a radiologically-impacted building (Bldg. 114 higher likelihood that the Sewer lines and trench were radiologically contaminated.
			perform multiple excavations and sampling may have provided a motive for falsifying results. 1) The Data Eval Form states "The comparison results for samples (110 and 124) were not equivalent for K-40, Ac-228, and Bi-214."			1) The Data Eval Form 'Summary of Findings' Summary of Findings states "The mean results for Bi-212, Pb-21
TU015	0	1	2) FSS samples (111 through 115, 117 through 124 and 127) were counted on 1/7/2007. Sample 125 was counted on 9/10/2010. Only samples 110, 116, and 126 were counted within 2 working days on 12/21/2006. The Christmas and New Year's holidays occurred during this period.	1	1) Scan and static measurement data did not contain the RSO signature.	were all higher than average for Parcel B"The Bi-214 and Pb-214 mean results were also higher than average 2) One Bi-214 result was negative and offsite and onsite analyses of samples 110 and 124 are not con 3) Soil probably used as backfill on Parcel C.
			1) Missing scan and static data and signature of surveyors or samples missing 2) Inconsistency between offsite and onsite lab results between onsite and offsite lab, large range of K-40 values		Gamma static and scan results were not provided in the SUPR	
TU016	2	1	3) Long time interval between when samples 066, 068, 073, and 078 were collected (2006) and analyzed (9/13/10). Data Eval Form states "FSS samples (066, 068, 073, and 078) were analyzed on 9/13/2010. The sample collection date was on 12/28/2006.	1	2) Gamma static and scan surveyor is not listed in the SUPR3) Names of surveyors/samplers not provided in SUPRs.	
			1) Logic Test 4 states FSS samples 072, 076, 077, 079, 080, and 081 analyzed within 2 working days. FSS samples 064, 065, 070, and 075 were analyzed on 12/1/2006. FSS samples 067, 069, 073, and 078 were analyzed on 9/13/2010. The analysis of samples			
			over 3 years later is suspicious. 2) The approval data for the Static Survey of 3/6/2008 pre-dates when the Static Survey was conducted on 11/28/2006. The Data Evaluation Form states "The survey date			
TU017	2	1	seems to be a mistake." However, the reviewer notes that the difference in dates is unusual and can not be dismissed under an assumption that this was a mistake. 3) The Data Evaluation Form states "The scan survey was performed on 11/28/2007. The survey date seems to be a mistake. The FSS samples were collected on 11/28/2006".	1	RSO signatures are missing from Static and Scan Survey data.	1) The Summary of Findings states "The K-S Test Flagged Pb-214, which was reported at higher concentratio survey units in Parcel B." A higher Pb-214 indicates elevated Ra-226 is present. The Data Eval Form does not 214 and Ra-226 results from the analysis were comparable. This information would provide insight into whe
			The reviewer notes that given the fact that the scan, static, and FSS survey/sample collection dates do not follow the expected chronological order, this is evidence of falsification of data.		2) Sampler/Surveyor names are missing from the SUPR.	TU017 were falsified or not.
			4) The Data Evaluation Form states "The K-S Test Flagged Pb-214, which was reported at higher concentrations than other survey units in Parcel B." The reviewer notes that a higher Pb-214 indicates elevated Ra-226 is present. Further investigation will be needed to identify what value of Ra-226 was reported by the lab compared to the elevated Pb-214 result in order to determine if this is an indication of data falsification or a data			
			quality issue. 1) The Data Evaluation Form Summary of Findings states "The K-S test flagged Pb-214, Ac-228, and Pb-121. These radionuclides, plus Bi-214 and Bi-212, presented higher-			
			than-average results in TU018 compared to the rest of Parcel B. High results are not considered to be evidence of potential data falsification." The reviewer notes, however, that elevated concentrations of Bi-214 and Pb-214 indicate the presence of elevated Ra-226, but the Data Evaluation Form does not state if comparable Ra-226 results were		1) Cita DCO airmatura maiosin a franc Common Statio and	
TU018	2	1	reported and if so, if these levels exceeded the release criteria. Elevated levels of Bi-212 and Ac-228 indicate elevated concentrations of Th-232, however the Data Evaluation Form has not stated if this is the case or if the data are deemed to be anomalous. Further investigation by the Navy is needed.	1	1) Site RSO signature missing from Gamma Static and Scan data in the SUPR.	Resample due to different collection dates for samples for on- and off-site labs and uncertainty due to multiper in K-40 data.
			2) The Data Evaluation Form Logic Test 4 provides FSS analysis dates, as follows: "FSS samples 048 through 052, 054, 055, 056 through 062, 064, and 065 were analyzed on 1/7/2007 FSS sample 063 was analyzed on 1/4/2007." Analysis of one sample on 1/4/07 suggests potential for substitution.			
			1) On- and offsite samples had a different weight for sample 027 (difference of 102 grams). 2) Bi-214, K-40, Bi-212, all had the 3rd lowest results of all the TUs in Parcels B & D-2. In addition, Pb-214 mean results is			
TU019	2	1	the lowest of all TUs in Parcels B & D-2. The Data Evaluation Form argues that adjacent TU012 also had abnormally low mean concentrations in an area where the two TUs adjoin and therefore may represent a different soil type is represented rather than an indication of falsification. The reviewer acknowledges this may be the case but with the existing data, and the extensive data quality issues highlighted in data throughout Parcel		Gamma static and scan surveyor is not listed in the SUPR	
			B, sufficient information does not exist to determine the reason for the low values. The reviewer also notes that it is also possible the unusually low mean values for this data may be due to falsification. 1) Gamma static and scan date and time not provided in the SUPR			
TU020	2	1	2) Gamma Static Survey data ranged between 5,583 and 6,708 cpm. The Data Evaluation Form states this range is consistent with the gamma scan data; however the scan survey data ranged from 4.200 and 7,100 cpm. Therefore, the Static data is not consistent with		Gamma static and scan date and time not provided in SUPR.	Form notes, "Ac-228 mean result is the lowest of all TUs in Parcels B & D-2 Bi-214 mean result is 3rd low Parcels B & D-2 K-40 mean result is 3rd lowest of TUs in Parcels B & D-2 Pb-212 mean result is 3rd low Parcels B & D-2 Pb-214 mean result is the lowest of all TUs in Parcels B & D-2. " Form concludes these a
			the scan data since the range for the static surveys is very small compared to the scan data and what would be expected for environmental surveys of land areas. 3) Suspect worker involved in data collection at TU020.			expected ranges.
			1) Gamma Static Survey data ranged between 5,728 and 6,427 cpm. In contrast to the Data Evaluation Form for TU0020, the Data Evaluation Form for this TU 0021 states this range is an unusually narrow range for heterogeneous soil but is consistent with the			
			gamma scan range and the FSS dataset. Scan survey data ranged from 5.200 and 6,800 cpm. The reviewer notes that the Static and Scan data have too narrow of a range and therefore is suspect for falsification. 2) For the FSS sample 06, the onsite/offsite K-40 results differ by more than a factor of		Numerous discrepancies noted in the data (i.e.,	1) TU0021 contained the sewer line that was connected to or downstream from the radiologically-impacted 2) Section II, Item 2 of the Data Evaluation Form states "Final Systematic samples from this TU contain to
TU021	2	1	10x (7.796 vs. 0.707). Other data compares satisfactorily. The reviewer notes that having radionuclides of concern have comparable values between onsite and offsite data, but very different K-40 results has been proven in the past to be an indication of data falsification and is highly suspect for this TU021.	1	unusually low values and data ranges, negative Ra-226 values), discrepancies in K-40 results between onsite and offsite labs, yet no other sampling was conducted to confirm conditions at TU021.	concentrations of Bi-214, K-40, Pb-212, and Pb-214 compared to other TUs in Parcels B & D02. In addition TU020 and TU021 were sampled on the same day likely resulted in the disparity between Units and Day 3) Section II, item 2 of the Data Evaluation Form states that a review of the Ra-226 data shows that the Ra-226 in several samples have large negative values and are "apparently statistically indistinguishable from the reme
			3) Section II, Item 2 of the Data Evaluation Form states "Final Systematic samples from this TU contain low mean concentrations of Bi-214, K-40, Pb-212, and Pb-214 compared to other TUs in Parcels B & D02. In addition, the fact that TU020 and TU021 were sampled on the same day likely resulted in the disparity between Units and Days			level." The reviewer notes that large negative values of the Ra-26 data indicates a data quality issue and therefore not reliable for decision making/demonstrating the ROD criteria has been met.
TU022	0	0	fl ags .	1	None.	As in all other TUs, significant data quality issues exist, making the data unreliable for decision making and in compliance with the ROD release criteria.
TU023	2	1	1) Some samples were counted between 03/14/2207 and 03/19/2007. Samples #174, #179, #181-183 were counted on 09/09/2010 and 09/10/2010. 2) No name of static or scan surveyor provided in SUPR	1	1) 2) No name of static or scan surveyor provided in SUPR 2) Some samples were counted between 03/14/2207 and 03/19/2007. Samples #174, #179, #181-183 were counted on 09/09/2010 and	FSS samples could have been substituted in 2010 when recounted 3 years after collection. Recommend resallow variability Bi-214 and uncertainty about recounted samples.
TU024	2	2	1) FSS samples were collected on 11/16/2006. FSS confirmatory/biased samples were collected on 11/01/2006. 2) One final systematic sample has a result below 0 for Bi-214. Sample may have been substituted 3) on- and off-site lab sample had different	1	09/10/2010. No static survey date and time, no sampler name.	Recommend resampling due to uncertainty - different sample masses, low variability for Bi-214
TU025	0	1 0	weights 1. Samples were counted onsite 10/13/2006, with the exception of #2, #6, and #12, which were counted on 09/13/2010. Sample #14 was counted offsite on 11/22/2008. Substitution possible.	1 0	No static survey date and time, no sampler name.	Some uncertainty because samples counted over 4 years. 2010 counts may be due to recounting at request of Several Final Systematic Bi-214 samples present as outliers
TU027 TU028	0	1	Form notes, "FSS samples excluding #2 and #3 were counted onsite from 11/07/2006 to 11/09/2006. FSS samples #2 and #3 were counted on 09/21/2010. Sample #16 was counted offsite on 11/25/2008." Some samples counted years later, unclear if these were the original samples.	1	No static survey date and time, no sampler name. No static survey date and time, no sampler name.	FSS samples excluding #2 and #3 were counted onsite from 11/07/2006 to 11/09/2006. FSS samples #2 and #3 were counted on 09/21/2010. Sample #16 was counted offsite on 11/25/2008.
TU028 TU029 TU030 TU033	0 0	1 0	On-site lab counted samples over 4 days.	1 1 1	No signature from RSO on gamma static or scan surveys. Static surveyor name not provided in SUPR. No static survey date and time, no sampler name.	Single set of FSS_SYS samples suggests falsification less likely; work done in 2006.
TU036	0	0	Form notes, "Samples were counted on 03/14/2007 or 03/15/2007; five samples were re-analyzed in 2010 during lab method review by EPA and CDPH" and ". A combination of samples analyzed in March 2007 and reanalyzed samples from September 2010 were		Sampler/surveyor name not provided in SUPR. Gamma static form undated.	Resample due to low Bi-214 FSS SYS variability, evidence of multiple data sets.
TIIO37	2	1	reported as the FSS survey results." Unclear why the original on-site lab results were replaced. May explain different populations, or not. Form notes, "Samples 6PBFS-039-10, -12, -13, -16, -17 through -19, and -22 through -	1	No static survey date and time, no sampler name.	Resample due to different weights for on-site/off-site lab samples, fact that samples were counted later to
	2	1 0	26 were all analyzed more than 2 days after collection." Form notes, "One FSS sample (040) were analyzed on 02/28/2007." This suggested	1 1	No signature from RSO on gamma static or scan surveys. No static survey date and time, no sampler name.	indications of different populations for Bi-214, K-40, and Ac-228. Resample due to different weights for on-site/off-site lab samples, indications of different populations for Bi-Ac-228, and low variability and evidence of different populations for Bi-214, Ac-228, and K-40 Ac-228, and low variability and evidence of different populations for Bi-214, Ac-228, and K-40
TU039 TU040	0	-				 FSS_SYS Samples counted on 4 days, and not sequentially. Form notes: " • FSS sample (132) analyzed or • FSS samples (117, 121, 122, 126, 127, 129, 131, and 134) analyzed on 07/17/2007 • FSS samples (118, 133, 120, 124, 123, 125, 128, and 130) analyzed on 07/18/2007. (119) analyzed on 07/19/2007."
TU039 TU040 TU041	2	1	FSS_SYS Samples counted on 4 days and not sequentially.	1	No signature from RSO on gamma static or scan surveys.	counted on 4 different days and not sequentially (suggests notontial face)
TU039 TU040 TU041	2	1		1	No signature from RSO on gamma static or scan surveys.	
TU039 TU040 TU041 TU042	2	1	1. FSS_samples were counted over 1 week, suggesting possible substitution. Form notes, "Samples were counted from 03/21/2007 through 03/28/2007." 2. Different weights (2 grams) between on-site and off-site lab. 1. FSS_samples were counted over 6 days suggesting possible substitution. Form notes, "Samples were counted between 03/23/2007 and 03/28/2007." 2.	1	No static survey date and time, no sampler name.	Resample due to sample counting over 1 week (potential for substitution), different weights between on-site a large difference in 1 Ac-228 result, and evidence of different populations on Q-Q plots. Resample due to FSS sample counting over 6 days (potential for substitution), significant differences between
TU039 TU040 TU041 TU042 TU043	2	1 1	 1. FSS_samples were counted over 1 week, suggesting possible substitution. Form notes, "Samples were counted from 03/21/2007 through 03/28/2007." 2. Different weights (2 grams) between on-site and off-site lab. 1. FSS_samples were counted over 6 days suggesting possible substitution. Form notes, "Samples were counted between 03/23/2007 and 03/28/2007." 2. Samples have different weights. Form notes, "6PBFS-044-01 has an onsite lab mass of 357 grams and an offsite lab mass of 374 grams, 6PBFS-044-12 has an onsite lab mass of 318 grams and an offsite lab mass of 324 grams." 1. Form notes, "FSS samples were counted within 2 days of collection. FSS-BIAS samples 	1 1	No static survey date and time, no sampler name. No static survey date and time, no sampler name.	Resample due to sample counting over 1 week (potential for substitution), different weights between on-site a large difference in 1 Ac-228 result, and evidence of different populations on Q-Q plots. Resample due to FSS sample counting over 6 days (potential for substitution), significant differences between site sample weights (not clear the same samples were counted), and the evidence for multiple populations bas Q-Q plot.
TU039 TU040 TU041 TU042 TU043 TU044	2 2	1 1	 FSS_samples were counted over 1 week, suggesting possible substitution. Form notes, "Samples were counted from 03/21/2007 through 03/28/2007." Different weights (2 grams) between on-site and off-site lab. FSS_samples were counted over 6 days suggesting possible substitution. Form notes, "Samples were counted between 03/23/2007 and 03/28/2007." Samples have different weights. Form notes, "6PBFS-044-01 has an onsite lab mass of 357 grams and an offsite lab mass of 374 grams, 6PBFS-044-12 has an onsite lab mass of 318 grams and an offsite lab mass of 324 grams." Form notes, "FSS samples were counted within 2 days of collection. FSS-BIAS samples 6PBFS-045-001 and -035 were counted between 23 and 34 days after collection." Low variability and inconsistent gamma static data. Form notes, "None of the FSS samples (6PBFS-046-01 to -18) were analyzed within 2 	1	No static survey date and time, no sampler name. No static survey date and time, no sampler name. No sampler/surveyor name in SUPR	Resample due to sample counting over 1 week (potential for substitution), different weights between on-site a large difference in 1 Ac-228 result, and evidence of different populations on Q-Q plots. Resample due to FSS sample counting over 6 days (potential for substitution), significant differences between site sample weights (not clear the same samples were counted), and the evidence for multiple populations bas Q-Q plot. Resample due to multiple populations for Bi-214, Ac-228, and K-40 and counting 2 FSS_Bias samples much substitution). Resample due to multiple populations for K-40 and possibly B-214 and because one FSS_Bias sample was described by the sample
TU039 TU040 TU041 TU043 TU044 TU045 TU046	2 2 2	1 1 1	1. FSS_samples were counted over 1 week, suggesting possible substitution. Form notes, "Samples were counted from 03/21/2007 through 03/28/2007." 2. Different weights (2 grams) between on-site and off-site lab. 1. FSS_samples were counted over 6 days suggesting possible substitution. Form notes, "Samples were counted between 03/23/2007 and 03/28/2007." 2. Samples have different weights. Form notes, "6PBFS-044-01 has an onsite lab mass of 357 grams and an offsite lab mass of 374 grams, 6PBFS-044-12 has an onsite lab mass of 318 grams and an offsite lab mass of 324 grams." 1. Form notes, "FSS samples were counted within 2 days of collection. FSS-BIAS samples 6PBFS-045-001 and -035 were counted between 23 and 34 days after collection." Suggests possible substitution. 2. Low variability and inconsistent gamma static data. 1. Form notes, "None of the FSS samples (6PBFS-046-01 to -18) were analyzed within 2 working days." Also, "Sample -01 was counted on 04/10/2007," which is more than 2 weeks after collection. Possible indication of sample substitution. 1. Form notes, "FSS samples 6PBFS-047-74 through -80, -82 through 90 were analyzed on 06/30/2007. FSS samples 6PBFS-047-81 and -91 were analyzed on 06/22/2007."	1	No static survey date and time, no sampler name. No static survey date and time, no sampler name. No sampler/surveyor name in SUPR No sampler/surveyor name in SUPR	Resample due to sample counting over 1 week (potential for substitution), different weights between on-site a large difference in 1 Ac-228 result, and evidence of different populations on Q-Q plots. Resample due to FSS sample counting over 6 days (potential for substitution), significant differences between site sample weights (not clear the same samples were counted), and the evidence for multiple populations base Q-Q plot. Resample due to multiple populations for Bi-214, Ac-228, and K-40 and counting 2 FSS_Bias samples much substitution). Resample due to multiple populations for K-40 and possibly B-214 and because one FSS_Bias sample was completely different day than the others (which were not counted within 2 days of collection). These indices sample substitution
TU039 TU040 TU041 TU043 TU044 TU045 TU046	2 2 2 2	1 1 1	1. FSS_samples were counted over 1 week, suggesting possible substitution. Form notes, "Samples were counted from 03/21/2007 through 03/28/2007." 2. Different weights (2 grams) between on-site and off-site lab. 1. FSS_samples were counted over 6 days suggesting possible substitution. Form notes, "Samples were counted between 03/23/2007 and 03/28/2007." 2. Samples have different weights. Form notes, "6PBFS-044-01 has an onsite lab mass of 357 grams and an offsite lab mass of 374 grams, 6PBFS-044-12 has an onsite lab mass of 318 grams and an offsite lab mass of 324 grams." 1. Form notes, "FSS samples were counted within 2 days of collection. FSS-BIAS samples 6PBFS-045-001 and -035 were counted between 23 and 34 days after collection." Suggests possible substitution. 2. Low variability and inconsistent gamma static data. 1. Form notes, "None of the FSS samples (6PBFS-046-01 to -18) were analyzed within 2 working days." Also, "Sample -01 was counted on 04/10/2007," which is more than 2 weeks after collection. Possible indication of sample substitution. 1. Form notes, "FSS samples 6PBFS-047-74 through -80, -82 through 90 were analyzed on 06/30/2007. FSS samples 6PBFS-047-25 through -43 were analyzed on 06/22/2007." Also, "FSS-Bias samples 6PBFS-047-25 through -43 were analyzed 24 days after collection. All other samples were counted within 2 weeks of sample collection." This suggests potential substitution. 1. Form notes, "• One FSS sample (012) was analyzed on 05/07/2007. • One FSS sample (006) was analyzed on 05/11/2007.	1	No static survey date and time, no sampler name. No static survey date and time, no sampler name. No sampler/surveyor name in SUPR	Resample due to sample counting over 1 week (potential for substitution), different weights between on-site a large difference in 1 Ac-228 result, and evidence of different populations on Q-Q plots. Resample due to FSS sample counting over 6 days (potential for substitution), significant differences between site sample weights (not clear the same samples were counted), and the evidence for multiple populations bas Q-Q plot. Resample due to multiple populations for Bi-214, Ac-228, and K-40 and counting 2 FSS_Bias samples much substitution). Resample due to multiple populations for K-40 and possibly B-214 and because one FSS_Bias sample was completely different day than the others (which were not counted within 2 days of collection). These indic sample substitution
TU039 TU040 TU041 TU042 TU043 TU044 TU045 TU046	2 2 2 2	1 1 1 1 1	1. FSS_samples were counted over 1 week, suggesting possible substitution. Form notes, "Samples were counted from 03/21/2007 through 03/28/2007." 2. Different weights (2 grams) between on-site and off-site lab. 1. FSS_samples were counted over 6 days suggesting possible substitution. Form notes, "Samples were counted between 03/23/2007 and 03/28/2007." 2. Samples have different weights. Form notes, "6PBFS-044-01 has an onsite lab mass of 357 grams and an offsite lab mass of 374 grams, 6PBFS-044-12 has an onsite lab mass of 318 grams and an offsite lab mass of 324 grams." 1. Form notes, "FSS samples were counted within 2 days of collection. FSS-BIAS samples 6PBFS-045-001 and -035 were counted between 23 and 34 days after collection." Suggests possible substitution. 2. Low variability and inconsistent gamma static data. 1. Form notes, "None of the FSS samples (6PBFS-046-01 to -18) were analyzed within 2 working days." Also, "Sample -01 was counted on 04/10/2007," which is more than 2 weeks after collection. Possible indication of sample substitution. 1. Form notes, "FSS samples 6PBFS-047-74 through -80, -82 through 90 were analyzed on 06/30/2007. FSS samples 6PBFS-047-81 and -91 were analyzed on 06/22/2007." Also, "FSS-Bias samples 6PBFS-047-25 through -43 were analyzed 24 days after collection. All other samples were counted within 2 weeks of sample collection." This suggests potential substitution. 1. Form notes, "• One FSS sample (012) was analyzed on 05/07/2007.	1	No static survey date and time, no sampler name. No static survey date and time, no sampler name. No sampler/surveyor name in SUPR No sampler/surveyor name in SUPR	Resample due to sample counting over 1 week (potential for substitution), different weights between on-site of large difference in 1 Ac-228 result, and evidence of different populations on Q-Q plots. Resample due to FSS sample counting over 6 days (potential for substitution), significant differences between site sample weights (not clear the same samples were counted), and the evidence for multiple populations base Q-Q plot. Resample due to multiple populations for Bi-214, Ac-228, and K-40 and counting 2 FSS_Bias samples much substitution). Resample due to multiple populations for K-40 and possibly B-214 and because one FSS_Bias sample was completely different day than the others (which were not counted within 2 days of collection). These indices sample substitution Resample due to multiple populations for K-40 and probably for Ac-228 and Bi-214, and because 2 samples on a different das, suggesting potential substitution. FSS_Bias samples, which Q-Q plots indicate are a difference were counted 24 days after collection.
TU047 TU047 TU047 TU048	2 2 2	1 1 1 1 1	1. FSS_samples were counted over 1 week, suggesting possible substitution. Form notes, "Samples were counted from 03/21/2007 through 03/28/2007." 2. Different weights (2 grams) between on-site and off-site lab. 1. FSS_samples were counted over 6 days suggesting possible substitution. Form notes, "Samples were counted between 03/23/2007 and 03/28/2007." 2. Samples have different weights. Form notes, "6PBFS-044-01 has an onsite lab mass of 357 grams and an offsite lab mass of 374 grams, 6PBFS-044-12 has an onsite lab mass of 318 grams and an offsite lab mass of 324 grams." 1. Form notes, "FSS samples were counted within 2 days of collection. FSS-BIAS samples 6PBFS-045-001 and -035 were counted between 23 and 34 days after collection." Suggests possible substitution. 2. Low variability and inconsistent gamma static data. 1. Form notes, "None of the FSS samples (6PBFS-046-01 to -18) were analyzed within 2 working days." Also, "Sample-01 was counted on 04/10/2007," which is more than 2 weeks after collection. Possible indication of sample substitution. 1. Form notes, "FSS samples 6PBFS-047-74 through -80, -82 through 90 were analyzed on 06/30/2007. FSS samples 6PBFS-047-81 and -91 were analyzed on 06/22/2007." Also, "FSS-Bias samples 6PBFS-047-81 and -91 were analyzed 24 days after collection. All other samples were counted within 2 weeks of sample collection." This suggests potential substitution. 1. Form notes, "• One FSS sample (012) was analyzed on 05/11/2007. • One FSS sample (006) was analyzed on 09/10/2010. • One FSS sample (008) was analyzed on 09/10/2010. • One FSS sample (008) was analyzed on 09/10/2010. • One FSS sample (016) was analyzed on 09/10/2010. • One FSS sample (016) was analyzed on 09/10/2010. • One FSS sample (016) was analyzed on 09/10/2010. • One FSS sample (016) was analyzed on 09/10/2010. • One FSS sample (016) was analyzed on 09/10/2010. • One FSS sample (016) was analyzed on 09/10/2010. • One FSS sample (016) was analyzed on 09/10/2010. • One FSS sample (016) was analyz	1 1	No static survey date and time, no sampler name. No static survey date and time, no sampler name. No sampler/surveyor name in SUPR No sampler/surveyor name in SUPR No static survey date and time, no sampler name. No signature from RSO on gamma static or scan surveys.	Resample due to Sample counting over 1 week (potential for substitution), different weights between on-site a large difference in 1 Ac-228 result, and evidence of different populations on Q-Q plots. Resample due to FSS sample counting over 6 days (potential for substitution), significant differences between site sample weights (not clear the same samples were counted), and the evidence for multiple populations bas Q-Q plot. Resample due to multiple populations for Bi-214, Ac-228, and K-40 and counting 2 FSS_Bias samples much substitution). Resample due to multiple populations for K-40 and possibly B-214 and because one FSS_Bias sample was a completely different day than the others (which were not counted within 2 days of collection). These indic sample substitution Resample due to multiple populations for K-40 and probably for Ac-228 and Bi-214, and because 2 samples on a different das, suggesting potential substitution. FSS_Bias samples, which Q-Q plots indicate are a difference of the population of the form of the form of the population of the form of
TU040 TU041 TU042 TU044 TU045 TU047	2 2 2 2 2	1 1 1 1 1 1 1	1. FSS_samples were counted over 1 week, suggesting possible substitution. Form notes, "Samples were counted from 03/21/2007 through 03/28/2007." 2. Different weights (2 grams) between on-site and off-site lab. 1. FSS_samples were counted between 03/23/2007 and 03/28/2007." 2. Samples were counted between 03/23/2007 and 03/28/2007." 2. Samples have different weights. Form notes, "6PBFS-044-01 has an onsite lab mass of 374 grams, 6PBFS-044-12 has an onsite lab mass of 318 grams and an offsite lab mass of 324 grams." 1. Form notes, "FSS samples were counted within 2 days of collection. FSS-BIAS samples 6PBFS-045-001 and -035 were counted between 23 and 34 days after collection." Suggests possible substitution. 2. Low variability and inconsistent gamma static data. 1. Form notes, "None of the FSS samples (6PBFS-046-01 to -18) were analyzed within 2 working days." Also, "Sample-01 was counted on 04/10/2007," which is more than 2 weeks after collection. Possible indication of sample substitution. 1. Form notes, "FSS samples 6PBFS-047-74 through -80, -82 through 90 were analyzed on 06/30/2007. FSS samples 6PBFS-047-81 and -91 were analyzed on 06/22/2007." Also, "FSS-Bias samples 6PBFS-047-25 through -43 were analyzed on 06/22/2007." Also, "FSS-Bias samples 6PBFS-047-25 through -43 were analyzed 2d days after collection. All other samples were counted within 2 weeks of sample collection." This suggests potential substitution. 1. Form notes, "• One FSS sample (006) was analyzed on 05/11/2007. • One FSS sample (006) was analyzed on 05/11/2007. • One FSS sample (006) was analyzed on 09/09/2010. • One FSS sample (007) was analyzed on 09/09/2010. • One FSS sample (008) was analyzed on 09/10/2010. • One FSS sample (006) was analyzed on 09/10/2010. • One FSS sample (007) was analyzed on 09/10/2010. • One FSS sample (006) was analyzed on 09/10/2010. • One FSS sample (007) was analyzed on 09/10/2010. • One FSS sample (007) was analyzed on 09/10/2010. • One FSS sample (007) was analyzed on 09/10/2010. • One	1 1 1	No static survey date and time, no sampler name. No static survey date and time, no sampler name. No sampler/surveyor name in SUPR No sampler/surveyor name in SUPR No static survey date and time, no sampler name. No signature from RSO on gamma static or scan surveys.	Resample due to sample counting over 1 week (potential for substitution), different weights between on-site a large difference in 1 Ac-228 result, and evidence of different populations on Q-Q plots. Resample due to FSS sample counting over 6 days (potential for substitution), significant differences between site sample weights (not clear the same samples were counted), and the evidence for multiple populations bas Q-Q plot. Resample due to multiple populations for Bi-214, Ac-228, and K-40 and counting 2 FSS_Bias samples much substitution). Resample due to multiple populations for K-40 and possibly B-214 and because one FSS_Bias sample was completely different day than the others (which were not counted within 2 days of collection). These indices sample substitution Resample due to multiple populations for K-40 and probably for Ac-228 and Bi-214, and because 2 samples on a different das, suggesting potential substitution. FSS_Bias samples, which Q-Q plots indicate are a difference or a different das, suggesting potential substitution. FSS_Bias samples, which Q-Q plots indicate are a difference or counted 24 days after collection. Resample due to potential substitution - samples were counted over 12 days according to the form, but only analyzed on some days. Also, there is little variability for Bi-214 and evidence of multiple populations analyzed on some days. Also, there is little variability for Bi-214 and evidence of multiple populations and sampling to move contaminated area to TU 50. 2. Resarvariability gamma statics, which were inconsistent with FSS data, as well as low variability FSS_SYS data for Bi-2 137 and low variability FSS_Bias for K-40.
TU040 TU041 TU043 TU044 TU045 TU047 TU047	2 2 2 2 2	1 1 1 1 1 1 1 1	1. FSS_samples were counted over 1 week, suggesting possible substitution. Form notes, "Samples were counted from 03/21/2007 through 03/28/2007." 2. Different weights (2 grams) between on-site and off-site lab. 1. FSS_samples were counted between 03/23/2007 and 03/28/2007." 2. Samples were counted between 03/23/2007 and 03/28/2007." 2. Samples have different weights. Form notes, "6PBFS-044-01 has an onsite lab mass of 377 grams and an offsite lab mass of 374 grams, 6PBFS-044-12 has an onsite lab mass of 318 grams and an offsite lab mass of 324 grams." 1. Form notes, "FSS samples were counted between 23 and 34 days after collection." Suggests possible substitution. 2. Low variability and inconsistent gamma static data. 1. Form notes, "None of the FSS samples (6PBFS-046-01 to -18) were analyzed within 2 working days." Also, "Sample-01 was counted on 04/10/2007," which is more than 2 weeks after collection. Possible indication of sample substitution. 1. Form notes, "FSS samples 6PBFS-047-74 through -80, -82 through 90 were analyzed on 06/30/2007. FSS samples 6PBFS-047-74 through -80, -82 through 90 were analyzed on 06/30/2007. FSS samples 6PBFS-047-74 through -80, and the sample substitution. 1. Form notes, "One FSS sample (012) was analyzed on 05/07/2007. Also, "FSS-Bias samples 6PBFS-047-25 through -43 were analyzed 24 days after collection. All other samples were counted within 2 weeks of sample collection." This suggests potential substitution. 1. Form notes, "One FSS sample (002) was analyzed on 05/11/2007. One FSS sample (006) was analyzed on 09/10/2010. One FSS sample (008) was analyzed on 09/10/2010. One FSS sample (008) was analyzed on 09/05/2010. One FSS sample (006) was analyzed on 09/05/2010. FSS samples (001, 003, 004, 007, 009, 010, 011, 013, 014, 015, 017, and 018) were analyzed on 05/12/2007." Even without the samples analyzed in 2010, the fact that samples were counted on different days suggests the potential for falsification. Unusually low range for gamma static dataset inconsi	1 1 1	No static survey date and time, no sampler name. No static survey date and time, no sampler name. No sampler/surveyor name in SUPR No sampler/surveyor name in SUPR No static survey date and time, no sampler name. No signature from RSO on gamma static or scan surveys.	Resample due to sample counting over 1 week (potential for substitution), different weights between on-site a large difference in 1 Ac-228 result, and evidence of different populations on Q-Q plots. Resample due to FSS sample counting over 6 days (potential for substitution), significant differences between site sample weights (not clear the same samples were counted), and the evidence for multiple populations bas Q-Q plot. Resample due to multiple populations for Bi-214, Ac-228, and K-40 and counting 2 FSS_Bias samples much substitution). Resample due to multiple populations for K-40 and possibly B-214 and because one FSS_Bias sample was completely different day than the others (which were not counted within 2 days of collection). These indic samples substitution Resample due to multiple populations for K-40 and probably for Ac-228 and Bi-214, and because 2 samples on a different das, suggesting potential substitution. FSS_Bias samples, which Q-Q plots indicate are a difference on a different das, suggesting potential substitution. FSS_Bias samples, which Q-Q plots indicate are a difference on a different das, suggesting potential substitution in the properties of the form, but only analyzed on some days. Also, there is little variability for Bi-214 and evidence of multiple populations for K-40 and low variability for Bi-214 and evidence of multiple populations for K-40 and probably for Bi-214 and evidence of multiple populations for K-40 and probably for Bi-214 and evidence of multiple populations analyzed on some days. Also, there is little variability for Bi-214 and evidence of multiple populations for K-40 and low variability for Bi-214 and evidence of multiple populations for K-40 and low variability for Bi-214 and evidence of multiple populations for K-40 and low variability for Bi-214 and evidence of multiple populations for K-40 and low variability for Bi-214 and evidence of multiple populations for K-40 and low variability for Bi-214 and evidence of multiple populations for K-40 and low variabilit
TU049 TU047 TU047 TU048 TU049 TU050	2 2 2 2 2 2	1 1 1 1 1 1 1	1. FSS_samples were counted over 1 week, suggesting possible substitution. Form notes, "Samples were counted from 03/21/2007 through 03/28/2007." 2. Different weights (2 grams) between on-site and off-site lab. 1. FSS_samples were counted between 03/23/2007 and 03/28/2007." 2. Samples were counted between 03/23/2007 and 03/28/2007." 2. Samples have different weights. Form notes, "GPBFS-044-01 has an onsite lab mass of 357 grams and an offsite lab mass of 374 grams, 6PBFS-044-12 has an onsite lab mass of 318 grams and an offsite lab mass of 324 grams." 1. Form notes, "FSS samples were counted within 2 days of collection. FSS-BIAS samples 6PBFS-045-001 and -035 were counted between 23 and 34 days after collection." Suggests possible substitution. 2. Low variability and inconsistent gamma static data. 1. Form notes, "None of the FSS samples (GPBFS-046-01 to -18) were analyzed within 2 working days." Also, "Sample -01 was counted on 04/10/2007," which is more than 2 weeks after collection. Possible indication of sample substitution. 1. Form notes, "FSS samples 6PBFS-047-74 through -80, -82 through 90 were analyzed on 06/30/2007. FSS samples 6PBFS-047-81 and -91 were analyzed on 06/22/2007." Also, "FSS-Bias samples 6PBFS-047-25 through -43 were analyzed on 06/22/2007." Also, "FSS-Bias samples 6PBFS-047-25 through -43 were analyzed 24 days after collection. All other samples were counted within 2 weeks of sample collection." This suggests potential substitution. 1. Form notes, "One FSS sample (002) was analyzed on 05/11/2007. • One FSS sample (006) was analyzed on 09/10/2010. • One FSS sample (005) was analyzed on 09/10/2010. • One FSS sample (006) was analyzed on 09/10/2010. • One FSS sample (006) was analyzed on 09/10/2010. • One FSS sample (006) was analyzed on 09/10/2010. • One FSS sample (006) was analyzed on 09/10/2010. • One FSS sample (006) was analyzed on 09/10/2010. • One FSS sample (006) was analyzed on 09/10/2010. • One FSS sample (006) was analyzed on 09/10/2010. • One FSS sample (006)	1 1 1	No static survey date and time, no sampler name. No static survey date and time, no sampler name. No sampler/surveyor name in SUPR No sampler/surveyor name in SUPR No static survey date and time, no sampler name. No signature from RSO on gamma static or scan surveys. SUPR did not have static survey date and time	Resample due to sample counting over 1 week (potential for substitution), different weights between on-site s large difference in 1 Ac-228 result, and evidence of different populations on Q-Q plots. Resample due to FSS sample counting over 6 days (potential for substitution), significant differences between site sample weights (not clear the same samples were counted), and the evidence for multiple populations bas Q-Q plot. Resample due to multiple populations for Bi-214, Ac-228, and K-40 and counting 2 FSS_Bias samples much substitution). Resample due to multiple populations for K-40 and possibly B-214 and because one FSS_Bias samples was completely different day than the others (which were not counted within 2 days of collection). These indic sample substitution Resample due to multiple populations for K-40 and probably for Ac-228 and Bi-214, and because 2 samples on a different das, suggesting potential substitution. FSS_Bias samples, which Q-Q plots indicate are a difference on a different das, suggesting potential substitution. FSS_Bias samples, which Q-Q plots indicate are a difference on a different day sample due to potential substitution - samples were counted 24 days after collection. Resample due to potential substitution - samples were counted over 12 days according to the form, but only analyzed on some days. Also, there is little variability for Bi-214 and evidence of multiple populations and sampling to move contaminated area to TU 50. 2. Resample due to low variability gamma static. Also, there is little variability FSS_Bias for K-40. 1. Resample due to low variability gamma static data set that was inconsistent with scan data and the FSS of inconsistency between gamma scan and FSS data set. Also, low variability of B-214, AC-228, K-40 FSS_Bias samples are not related to the gamma scan data. 1. Resample due to low variability gamma static data set that was inconsistent with scan data and the FSS of inconsistency between gamma scan and FSS data set. Also, there are multiple populations for
TU049 TU047 TU047 TU048 TU049 TU050	2 2 2 2 2 2	1 1 1 1 1 1 1 1	1. FSS_samples were counted over 1 week, suggesting possible substitution. Form notes, "Samples were counted from 03/21/2007 through 03/28/2007." 2. Different weights (2 grams) between on-site and off-site lab. 1. FSS_samples were counted between 03/23/2007 and 03/28/2007." 2. Samples were counted between 03/23/2007 and 03/28/2007." 2. Samples have different weights. Form notes, "6PBFS-044-01 has an onsite lab mass of 377 grams and an offsite lab mass of 374 grams, 6PBFS-044-12 has an onsite lab mass of 318 grams and an offsite lab mass of 324 grams." 1. Form notes, "FSS samples were counted between 23 and 34 days after collection." Suggests possible substitution. 2. Low variability and inconsistent gamma static data. 1. Form notes, "None of the FSS samples (6PBFS-046-01 to -18) were analyzed within 2 working days." Also, "Sample-01 was counted on 04/10/2007," which is more than 2 weeks after collection. Possible indication of sample substitution. 1. Form notes, "FSS samples 6PBFS-047-74 through -80, -82 through 90 were analyzed on 06/30/2007. FSS samples 6PBFS-047-74 through -80, -82 through 90 were analyzed on 06/30/2007. FSS samples 6PBFS-047-74 through -80, and the sample substitution. 1. Form notes, "One FSS sample (012) was analyzed on 05/07/2007. Also, "FSS-Bias samples 6PBFS-047-25 through -43 were analyzed 24 days after collection. All other samples were counted within 2 weeks of sample collection." This suggests potential substitution. 1. Form notes, "One FSS sample (002) was analyzed on 05/11/2007. One FSS sample (006) was analyzed on 09/10/2010. One FSS sample (008) was analyzed on 09/10/2010. One FSS sample (008) was analyzed on 09/05/2010. One FSS sample (006) was analyzed on 09/05/2010. FSS samples (001, 003, 004, 007, 009, 010, 011, 013, 014, 015, 017, and 018) were analyzed on 05/12/2007." Even without the samples analyzed in 2010, the fact that samples were counted on different days suggests the potential for falsification. Unusually low range for gamma static dataset inconsi	1 1 1	No static survey date and time, no sampler name. No static survey date and time, no sampler name. No sampler/surveyor name in SUPR No sampler/surveyor name in SUPR No static survey date and time, no sampler name. No signature from RSO on gamma static or scan surveys. SUPR did not have static survey date and time	Resample due to sample counting over 1 week (potential for substitution), different weights between data set large difference in 1 Ac-228 result, and evidence of different populations on Q-Q plots. Resample due to FSS sample counting over 6 days (potential for substitution), significant differences between site sample weights (not clear the same samples were counted), and the evidence for multiple populations bas Q-Q plot. Resample due to multiple populations for Bi-214, Ac-228, and K-40 and counting 2 FSS_Bias samples much substitution). Resample due to multiple populations for K-40 and possibly B-214 and because one FSS_Bias samples was completely different day than the others (which were not counted within 2 days of collection). These indic sample substitution Resample due to multiple populations for K-40 and possibly for Ac-228 and Bi-214, and because 2 samples on a different das, suggesting potential substitution. FSS_Bias samples, which Q-Q plots indicate are a difference on a different das, suggesting potential substitution. FSS_Bias samples, which Q-Q plots indicate are a difference on a different das, suggesting potential substitution. FSS_Bias samples, which Q-Q plots indicate are a difference on a different das, suggesting potential substitution. FSS_Bias samples, which Q-Q plots indicate are a difference on a different das, suggesting potential substitution. FSS_Bias samples, which Q-Q plots indicate are a difference on a difference on the plot of the form, but only analyzed on some days. Also, there is little variability for Bi-214 and evidence of multiple populations and sampling to move contaminated area to TU 5.0. 2. Resample due to low variability gamma static data set that was inconsistent with scan data and the FSS contamination was in the area to the populations for K-40. 1. Resample due to low variability gamma static data set that was inconsistent with scan data and the FSS contamination was in the area that became TU 051A front the contact of the gamma scan and FSS data set. Also, th
TU049 TU047 TU047 TU048 TU048 TU048 TU048	2 2 2 2 2 2	1 1 1 1 1 1 1	1. FSS_samples were counted over 1 week, suggesting possible substitution. Form notes, "Samples were counted from 03/21/2007 through 03/28/2007." 2. Different weights (2 grams) between on-site and off-site lab. 1. FSS_samples were counted over 6 days suggesting possible substitution. Form notes, "Samples were counted between 03/23/2007 and 03/28/2007." 2. Samples were counted between 03/23/2007 and 03/28/2007." 2. Samples have different weights. Form notes, "FPBFS-044-12 has an onsite lab mass of 318 grams and an offsite lab mass of 324 grams, SPBFS-044-12 has an onsite lab mass of 318 grams and an offsite lab mass of 324 grams." 1. Form notes, "FSS samples were counted within 2 days of collection." FSS-BIAS samples GPBFS-045-001 and -035 were counted between 23 and 34 days after collection." Suggests possible substitution. 2. Low variability and inconsistent gamma static data. 1. Form notes, "None of the FSS samples (6PBFS-046-01 to -18) were analyzed within 2 working days." Also, "Sample-01 was counted on 04/10/2007," which is more than 2 weeks after collection. Possible indication of sample substitution. 1. Form notes, "FSS samples 6PBFS-047-24 through -80, -82 through 90 were analyzed on 06/30/2007. FSS samples 6PBFS-047-25 through -43 were analyzed on 06/22/2007." Also, "FSS-Bias samples 6PBFS-047-25 through -43 were analyzed 24 days after collection. All other samples were counted within 2 weeks of sample collection." This suggests potential substitution. 1. Form notes, "* One FSS sample (0012) was analyzed on 05/11/2007. • One FSS sample (002) was analyzed on 05/11/2007. • One FSS sample (003) was analyzed on 09/10/2010. • One FSS sample (004) was analyzed on 09/10/2010. • One FSS sample (006) was analyzed on 09/10/2010. • One FSS sample (008) was analyzed on 09/10/2010. • One FSS sample (008) was analyzed on 09/10/2010. • One FSS sample (008) was analyzed on 09/10/2010. • One FSS sample (008) was analyzed on 09/10/2010. • One FSS sample (008) was analyzed on 09/10/2010. • One FSS samp	1 1 1 1 1 1	No static survey date and time, no sampler name. No static survey date and time, no sampler name. No sampler/surveyor name in SUPR No sampler/surveyor name in SUPR No static survey date and time, no sampler name. No signature from RSO on gamma static or scan surveys. SUPR did not have static survey date and time SUPR did not have static survey date and time	Resample due to sample counting over 1 week (potential for substitution), different weights between on-sites large difference in 1 Ac-228 result, and evidence of different populations on Q-Q plots. Resample due to FSS sample counting over 6 days (potential for substitution), significant differences between site sample weights (not clear the same samples were counted), and the evidence for multiple populations bas Q-Q plot. Resample due to multiple populations for Bi-214, Ac-228, and K-40 and counting 2 FSS_Bias samples much substitution). Resample due to multiple populations for K-40 and possibly B-214 and because one FSS_Bias samples was completely different day than the others (which were not counted within 2 days of collection). These indic sample due to multiple populations for K-40 and probably for Ac-228 and Bi-214, and because 2 samples on a different das, suggesting potential substitution. FSS_Bias samples, which Q-Q plots indicate are a difference on a different das, suggesting potential substitution. FSS_Bias samples, which Q-Q plots indicate are a difference on a different das, suggesting potential substitution. FSS_Bias samples, which Q-Q plots indicate are a difference on an advised on some days. Also, there is little variability for Bi-214 and evidence of multiple populations and sampling to move contaminated area to TU 50. 2. Resarvariability gamma statics, which were inconsistent with FSS data, as well as low variability FSS_PS_SYS data for Bi-2 137 and low variability for Bi-214 and evidence of multiple populations for K-40. The properties of the parama scan data and the FSS contaminated portion of the trench became an evidence of the parama scan data and the FSS contaminated portion of the trench became an evidence of the parama scan data and the FSS contamination was in the area that became TU 051A from the tothe parama scan and FSS data set. Also, there are multiple populations for K-40. FSS sample due to low variability gamma static data set that was inconsistent with scan data and the F
TU039 TU040 TU041 TU043 TU044 TU045 TU047 TU047 TU048	2 2 2 2 2 2 2	1 1 1 1 1 1 1 1	1. FSS_samples were counted over 1 week, suggesting possible substitution. Form notes, "Samples were counted from 03/21/2007 through 03/28/2007." 2. Different weights (2 grams) between on-site and off-site lab. 1. FSS_samples were counted over 6 days suggesting possible substitution. Form notes, "Samples were counted between 03/23/2007 and 03/28/2007." 2. Samples were counted between 03/23/2007 and 03/28/2007." 2. Samples have different weights. Form notes, "6 PBFS-044-01 has an onsite lab mass of 374 grams, 6 PBFS-044-11 has an onsite lab mass of 374 grams, 6 PBFS-044-11 has an onsite lab mass of 374 grams, 6 PBFS-044-11 has an onsite lab mass of 318 grams and an offsite lab mass of 324 grams." 1. Form notes, "FSS samples were counted within 2 days of collection. FSS-BIAS samples 6 PBFS-045-001 and -035 were counted between 23 and 34 days after collection." Suggests possible substitution. 2. Low variability and inconsistent gamma static data. 1. Form notes, "None of the FSS samples (6 PBFS-046-01 to -18) were analyzed within 2 working days." Also, "Sample -01 was counted on 04/10/2007," which is more than 2 weeks after collection. Possible indication of sample substitution. 1. Form notes, "FSS samples 6 PBFS-047-74 through -80, -82 through 90 were analyzed on 06/30/2007. FSS samples 6 PBFS-047-74 through -80, -82 through 90 were analyzed on 06/30/2007. FSS samples 6 PBFS-047-75 through -43 were analyzed on 06/20/2007." Also, "FSS-Bias samples 6 PBFS-047-74 through -80, -82 through 90 were analyzed on 06/30/2007. FSS sample (006) was analyzed on 05/11/2007. • One FSS sample (006) was analyzed on 05/11/2007. • One FSS sample (006) was analyzed on 09/09/2010. • One FSS sample (007) was analyzed on 09/09/2010. • One FSS sample (008) was analyzed on 09/09/2010. • One FSS sample (008) was analyzed on 09/09/2010. • One FSS sample (006) was analyzed on 09/09/2010. • One FSS sample (007) was analyzed on 09/09/2010. • One FSS sample (008) was analyzed on 09/09/2010. • One FSS sample sample dataset wit	1 1 1 1 1 1	No static survey date and time, no sampler name. No static survey date and time, no sampler name. No sampler/surveyor name in SUPR No sampler/surveyor name in SUPR No static survey date and time, no sampler name. No signature from RSO on gamma static or scan surveys. SUPR did not have static survey date and time SUPR did not have static survey date and time SUPR did not have static survey date and time	Resample due to sample counting over 1 week (potential for substitution), different weights between on-site a large difference in 1 Ac-228 result, and evidence of different populations on Q-Q plots. Resample due to FSS sample counting over 6 days (potential for substitution), significant differences between site sample weights (not clear the same samples were counted), and the evidence for multiple populations bas Q-Q plot. Resample due to multiple populations for BI-214, Ac-228, and K-40 and counting 2 FSS_Bias samples much substitution). Resample due to multiple populations for K-40 and possibly B-214 and because one FSS_Bias sample was completely different day than the others (which were not counted within 2 days of collection). These indic sample substitution Resample due to multiple populations for K-40 and possibly B-214 and because one FSS_Bias sample was completely different day than the others (which were not counted within 2 days of collection). These indic sample substitution and different day, suggesting potential substitution. FSS_Bias samples, which Q-Q plots indicate are a different day, suggesting potential substitution. FSS_Bias samples, which Q-Q plots indicate are a different days suggesting potential substitution. FSS_Bias samples, which Q-Q plots indicate are a different day suggesting potential substitution and sampling to move contaminated area to TU SO. 2. Resample due to potential substitution - samples were counted over 12 days according to the form, but only analyzed on some days. Also, there is little variability for Bi-214 and evidence of multiple populations for Bi-213 and low variability for Bi-214 and evidence of multiple populations for Bi-213 and low variability gamma statics, which were inconsistent with fSS data, as well as low variability fSS_SS state and the SS_SS data set. Also, there are multiple populations for K-40. 1. Resample due to low variability gamma static data set that was inconsistent with scan data and the FSS cinconsistency between gamma scan and FSS dat
TU039 TU041 TU041 TU043 TU044 TU045 TU047 TU047 TU048 TU050 TU050 TU050A	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	1 1 1 1 1 1 1 1 1 1	1. FSS_samples were counted over 1 week, suggesting possible substitution. Form notes, "Samples were counted from 03/21/2007 through 03/28/2007." 2. Different weights (2 grams) between on-site and off-site lab. 1. FSS_samples were counted over 6 days suggesting possible substitution. Form notes, "Samples were counted between 03/23/2007 and 03/28/2007." 2. Samples have different weights. Form notes, "6 PBFS-044-01 has an onsite lab mass of 357 grams and an offsite lab mass of 318 grams, 6 PBFS-044-12 has an onsite lab mass of 318 grams and an offsite lab mass of 324 grams. 1. Form notes, "FSS samples were counted within 2 days of collection. FSS-BIAS samples 6PBFS-045-001 and -035 were counted between 23 and 34 days after collection." Suggests possible substitution. 2. Low variability and inconsistent gamma static data. 1. Form notes, "None of the FSS samples (6PBFS-046-01 to -18) were analyzed within 2 working days." Also, "Sample-01 was counted on 04/10/2007," which is more than 2 weeks after collection. Possible indication of sample substitution. 1. Form notes, "FSS samples 6PBFS-047-31 and -91 were analyzed on 06/20/2007." Also, "FSS-Bias samples 6PBFS-047-31 and -91 were analyzed on 06/20/2007." Also, "FSS-Bias samples 6PBFS-047-31 and -91 were analyzed on 06/20/2007." Also, "FSS-Bias samples 6PBFS-047-31 and -91 were analyzed on 05/10/2007. 2. Form notes, "9 One FSS sample (012) was analyzed on 05/15/2007. 3. One FSS sample (008) was analyzed on 05/15/2007. 4. One FSS sample (008) was analyzed on 05/15/2007. 5. One FSS sample (009) was analyzed on 05/15/2007. 6. One FSS sample (009) was analyzed on 05/15/2007. 7. One FSS sample (010) was analyzed on 05/15/2007. 8. One FSS sample (010) was analyzed on 05/15/2007. 9. One FSS sample (010) was analyzed on 05/15/2007. 1. Even without the samples analyzed in 2010, t	1 1 1 1 1 1 1	No static survey date and time, no sampler name. No static survey date and time, no sampler name. No sampler/surveyor name in SUPR No sampler/surveyor name in SUPR No static survey date and time, no sampler name. No signature from RSO on gamma static or scan surveys. SUPR did not have static survey date and time SUPR did not have static survey date and time	Resample due to FSS sample counting over 6 days (potential for substitution), significant differences between site sample weights (not clear the same samples were counted), and the evidence for multiple populations bas Q-Q-plot. Resample due to multiple populations for Bi-214, Ac-228, and K-40 and counting 2 FSS_Bias samples much I substitution). Resample due to multiple populations for K-40 and possibly B-214 and because one FSS_Bias samples was completely different day than the others (which were not counted within 2 days of collection). These indictions ample substitution. Resample due to multiple populations for K-40 and possibly B-214 and because one FSS_Bias samples was completely different day, than the others (which were not counted within 2 days of collection). These indictions are a different day, suggesting potential substitution. FSS_Bias samples, which Q-Q plots indicate are a difference were counted 24 days after collection. Resample due to multiple populations for K-40 and probably for Ac-228 and Bi-214, and because 2 samples on a different das, suggesting potential substitution. FSS_Bias samples, which Q-Q plots indicate are a difference were counted 24 days after collection. 1. TU49 modified after 5 rounds of excavation and sampling to move contaminated area to TU 50. 2. Resampled ue to potential substitution and sampling to move contaminated area to TU 50. 2. Resampled ue to low variability gamma static data set that was inconsistent with scan data and the FSS dinconsistency between gamma scan and FSS data set. Also, low variability of B-214, Ac-228, K-40 FSS_Bias samples are not related to the gamma scan data. 1. Resample due to low variability gamma static data set that was inconsistent with scan data and the FSS dinconsistency between gamma scan and FSS data set. Also, low variability of B-214, Ac-228, K-40 FSS_Bias samples are not related to the gamma scan data. 1. Resample due to low variability gamma static data set that was inconsistent with scan data and the FSS dinconsistency b

			1. On- and off-site weights for sample 92 were different, suggesting possible sample			1. Resample due to different weights for on- and off-site lab and counting of samples at off-site lab over a year later,
TU060	2	1	substitution. 2. Form notes inconsistent results between off-site and on-site lab for multiple radionuclides.	1	1. No RSO signature for gamma scans or survey.	suggesting possible sample substitution; inconsistent results between off-site and on-site lab; and low variability in Bi-214 FSS_SYS data set.
TU061	2	1	 FSS_SYS Samples collected over two days. K-40 has much higher variability and Cs- 137 has a much lower variability for samples collected the second day, suggesting different population. Bi-214 samples collected the first day have a lower mean and lower variability than those collected the second day. 	1	No reviewer or report data for gamma statics.	1. Resample due to uncertainty. FSS_SYS samples collected on two days but show significantly different results, suggesting different populations. FSS_Bias samples for K-40 and Bi-214 have lower variability than FSS_SYS. Also, gamma static max is a bit low.
TU062	0	0		1	No reviewer or report data for gamma statics.	
TU063	0			1	No RSO signature for gamma scans or survey.	Multiple populations do not necessarily indicate falsification.
TU064	0					1. DON had one sample recounted as part of a quality review.
TU065	2	1	Gamma scan and gamma statics were inconsistent with each other. Gamma statics had low variability.	1	SUPR did not have static survey date and time	1. Resample due to inconsistent gamma scan and gamma statics, low variability Bi-214 FSS_SYS.
TU125	2	1	Gamma scan conducted after or during collection of FSS_SYS samples.	1	SUPR did not have static survey date and time	1. Resample due to apparent different populations of K-40 between FSS_SYS and FSS_Bias, low variability of Ac-228 and Bi- 214 FSS_SYS and FSS_Bias.
TU126	2	1	Nearly identical gamma scan and gamma static data ranges. K-40 data appear to indicate different sources for FSS_SYS and FSS_Bias samples.	1	No reviewer or review date for gamma statics.	 Multiple flags for K-S test (compared to results from B and D-2). Ac-228 mean 7th lowest. K-40 mean 7th highest. Bi-21 mean is 7th lowest. Pb-212 is 12th lowest. Resample due to unusually consistent gamma static and gamma scan data, low variability FSS_SYS and FSS_Bias for Ac-228 and Bi-214 and K-40 FSS_SYS, and the potential that the K-40 sample indicate different sources.
TU127	2	1	 Unusually consistent gamma scan and gamma static data ranges. Possible factor of 8 or 9 difference between on-site and off-site lab results. No FSS_Bias samples even though there were exceedences in the gamma scan and gamma static data. 	1	No reviewer or review date for gamma statics.	1. Resample due to unusually consistent gamma scan and gamma static data ranges, failure to collect bias samples when there were gamma scan and gamma static exceedences, multiple populations in FSS_SYS data for Ac-228, Bi-214, K-40.
TU128	2	1	Samples appear to be from different sources (data sets have different slopes and slope breaks)	1	SUPR did not have static survey date and time	1. Resample due to different sample sources, based on K-40 and Ac-228 Q-Q plots.
TU131	2	1	 Possible failure to collect gamma scan after final excavation and before FSS_SYS samples were collected. Possible factor of 8 or 9 difference between on-site and off-site lab results. Data indicate different sources (populations) for Bi-214, K-40 and Ac-228. 	1	 SUPR did not have static survey date and time. Gamma scan may not have been conducted after fina excavation. 	1. Resample due to different sources as indicated by the Bi-214, K-40, and Ac-228 data, possible large differences between on- and off-site lab data, and potential failure to collect gamma scan data after final excavation.
TU186	2	1	 Four samples analyzed by on-site lab 8 days after the other 14 samples were analyzed, which could indicate sample substitution. Different slopes for each K-40 data set indicates different populations, suggesting different sample sources. 	1	No sampler name.	 Form notes about sample analysis, "Samples 55-58, 60, 62-64, 66, and 68-72 were analyzed on 11/10/10. Samples 59, 62 65, and 67 were analyzed on 11/18/2010." This is suspicious - there may have been sample substitution for the 4 samples analyzed more than a week later. Resample due to potential sample substitution of 4 samples in FSS_SYS set and probable different sample source for FSS_SYS, FSS_Bias, SYS_1, and characterization samples based on K-40 Q-Q plots.
			that a sign of falsifying or failure to follow the workplan (e.g. data quality problems) have be			
	So even if a c	oncern has	been noted, if the level of concern is relatively low, it still may not result in a recommendation	on for resa	mpling	

arcer bire	ench Units w	ith notes of	f signs of fa	lsifiying and	or failure to	o follow wor	rkplan (whic	h could crea	ate data qua	lity concerr	s, even in th	ne absence	of signs of fa	alisfication)			
	(This sheet s													,			
ease Note	e: The score	of 1 shows	that a sign	of falsifying	or failure to	follow the	workplan (e	e.g. data qua	ality probler	ns) have be	en noted. Ti	his does no	t indicate th	e severity o	f the concer	n.	
	So even if a																
	In addition,												ction.				
	The compila																
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	Overall	Signs of	Failure to														
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Unit	score (0,1,		workplan														
	or 2)		(1=Y, 0=N)														
		0,	(= :, 0 ::,														
Total	51	56	63														
Count	21	30	05														
TU001	2	1	1														
TU002	2	1	1														
TU003	2	1	1														
TU004	2	1	1														
TU005	2	1	1														
TU006	2	1	1														
TU007	2	1	1														
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TU128	2	1	1														
TU131	2	1	1														
TU186	2	1	1														
	e. The scorir	ng as 1 shov	vs that a sig	n of falsifyir	ng or failure	to follow th	ie workplan	(e.g. data q	uality probl	ems) have b	een noted.	This does n	ot indicate t	the severity	of the conc	ern.	
lease Note	<u>c. m</u> c 300111																
T		concern ha	s been note	ea, it the lev	ei of concer	ii is reiativei	y iow, it still	i may not re	suit in a rec	ommenuan	on for resam	npiing					
T	So even if a	concern ha	s been note	ed, if the leve	ei oi conceri	ii is relativei	y iow, it still	i may not re	suit in a rec	ommenuati	on for resam	npiing					

Building	Survey	ding Site Sur	,	Rounds of	Gamma scan or static concerns	On vs offsite lab	Time	Suspect	Name, if	Name, if	Signs of falsifying	Signs of falsification summary	Failure to follow workplan	Signs of failure to follow	Comments - Other	Followup needed, e.g. Recomm
Site	Unit			excavatio n		Offsite lab samples for Sr-90 have 4 to 5 times the mass	Series	(1=yes, 0=no)	suspect	suspect	(1=Yes, 0=no)	,	(1=Y, 0=N)	workplan		questions for Navy endation
				0 rounds of excavatio	with the scan data and the reference	compared to the onsite lab. 34 available isotopes comparisons between onsite and offsite data 5 had differences greater than a factor of ten. However, all of these			No Scan/Stat ic	ic		FSS samples collected over a period of 19 days and the onsite lab analysis was not completed for two years. FSS samples were			FSS samples were collected from 05/26/2005 to	Evaluin the delay of sail
114	SU 1	NA	NA	n, no bias samples collected	area dataset. The gamma scan data is consistent with the static data and the reference area dataset.	values near zero. FSS samples were collected from 05/26/2005 to 06/14/2005, however samples were counted between 05/01/2007 and 05/03/2007.	NA	0	Name	Surveyor Name Provided	1	collected from 05/26/2005 to 06/14/2005, Samples were counted between 05/01/2007 and 05/03/2007.	0	NA	06/14/2005, Samples were counted between 05/01/2007 and 05/03/2007. Scan/Static Surveyor Name Not Provided	Explain the delay of soil collection and counting dates Resample
				0 rounds of excavatio n, no bias	_	The samples that were send to the offsite lab for Sr-90 analysis have larger mass than the samples that were processed onsite.			No Scan/Stat ic Surveyor	No Scan/Stat ic Surveyor		FSS samples collected over a period of 19 days and the onsite lab analysis was not completed for two years. FSS samples were collected from 05/26/2005 to 06/14/2005,			FSS samples were collected from 05/26/2005 to 06/14/2005, Samples were counted between	Explain the delay of soil
114	SU 2	NA	NA	samples collected	consistent with the static data and the reference area dataset.	FSS samples were collected from 05/26/2005 to 06/14/2005, Samples were counted between 05/01/2007 and 05/03/2007.	NA	0	Name Provided	Name Provided	1	Samples were counted between 05/01/2007 and 05/03/2007.	0	NA	05/01/2007 and 05/03/2007. Scan/Static Surveyor Name Not Provided	collection and counting dates Resample Why is Sample #10 K-
					Gamma Scan Data not provided in FSSR, The data package for SU-008 in the FSSR reports 340 static gamma measurements ranging from -1,033 net gamma cpm to 1,096 net gamma cpm,							Sample #10 presented a K-40 Results near zero. Two field duplicates 5 and 10 samples			Sample #10 presented a K-40 Results near zero. Two field duplicates #5 and #10 samples were counted on 9/23/2009, 251 days after all other samples were	40 is zero? Explain the delay in soil analysis. Explain why two field duplicates #5 and #10
				0 rounds of excavatio n, no bias samples	with mean value -192 and standard deviation 487. The gamma background was 6,899 cpm and the 3-sigma	Samples 1-20 were collected on 01/14/2009. Sample 1-9 were counted on 01/14/2009 (same working day), and samples 10-20 were counted on 01/15/2009 (after 1 working day). Two field			No Scan/Stat ic Surveyor Name	No Scan/Stat ic Surveyor Name		were counted on 9/23/2009, 251 days after all other samples were analyzed, possibly providing an opportunity to replace and reanalyze the sample. No explanation of the unusual delay in analysis was provided in the		Gamma scan data not provided in	analyzed, possibly providing an opportunity to replace and reanalyze the sample. No explanation of the unusual delay in analysis was provided in the report. Scan/Static Surveyor name not provided in FSSR. The investigation level was 4.2 standard deviations above	other samples were analyzed. Explain why the gamma static release criteria was
130	SU 8	NA	NA	collected	investigation level. Gamma Scan Data not provided in FSS. The data package for SU-017 in the FSSR reports 250 static gamma	duplicate (#5 & #10) samples were counted on 09/23/2009.	NA	0	Provided	Provided	1	report.	1	FSSR.	the mean.	4.2 standard deviation. Resample Explain the delay in soil
					measurements ranging from -928 net gamma cpm to 1,807 net gamma cpm, with mean value -241 and standard deviation 447. The gamma background											analysis. Explain why two field duplicates #1 and #9 samples was counted 247 days after
				0 rounds of excavatio n, no bias	was 6,899 cpm and the 3-sigma investigation level was 9,160 cpm. No measurements exceeded the investigation level. The investigation	Samples 1-20 were collected on 01/14/2009. Sample 1-19 were counted on 01/19/2009 (after 3 working days), and sample 20 was counted on 01/20/2009 (ater 4 working days). Two field duplicate (#1 and #9) samples were counted on 09/23/2009.			No Scan/Stat ic Surveyor	No Scan/Stat ic Surveyor		Two Field Duplicate samples 1 and 9 was analyzed 247 days after all other samples were analyzed, possibly providing an opportunity to replace and re-analyze the			Two Field Duplicate samples #1 and #9 was analyzed 247 days after all other samples were analyzed, possib providing an opportunity to replace and re-analyze the sample. No explanation of the unusual delay in analysis	ly were analyzed. Explain e why the gamma static
130	SU 17	NA	NA	samples collected ization and final	level was 4.5 sigma values above the mean.	The data is consistent for K-40 and Bi-214. The resulsts for Ac- 228 are approximately double.	NA	0	Name Provided	Name Provided	1	sample. No explanation of the unusual delay in analysis was provided in the reports.	1	Gamma Scan data not provided in FSSR.	was provided in the report. Scan/Static Surveyor Nam not provided in FSSR	increased to mean + 4.5 standard deviation. Resample
				systemati c samples collected												
				in Survey Units 1 and 2 are represent			One FSS sample									
				ative of two different soils,	One-minute static counts collected at each of the 16 systematic locations on 02/08/2007 by J. Hubbard. Gamma static counts ranged between 2,135 and		had a near-zero result for Bi-214,									
				was defined in			sample 6PB142S U1-22. There									
				the FSSR as a second subsurfac	Range was between 2,000 and 6,000 cpm – less than the investigation level of 6,092 cpm. Background rate was 5,400 cpm.		was also two negative Ac-228									
				e structure. Character ization		All Final Systematic samples were collected on 02/07/2007. FSS samples were collected after confirmatory/biased samples which were collected on 09/05/2006. Most FSS samples (14 of	FSS results (6PB142S U1-018		J Hubbard					"Characterization" gamma scan	Data quality issue for FSS samples with low activities for	or
142	SU 1	NA	NA	samples were collected	background +3 sigma (σ) investigation level of 6,581 cpm. Background rate was 5,100 cpm.	16) were analyzed within 3 working days; the other two FSS samples were analyzed within 1 working day. Onsite and offsite data were consistent.	and 6PB142S U1-025)		/ D Rosenhag en	NA	1	"Characterization" gamma scan performed the day after sampling. "Final Status" gamma scan also performed after sampling.		performed the day after sampling.	Bi-214, Pb-214 and Ac-228. "Characterization" gamm	a Explain why gamma
				ization and final systemati c samples			sample had a near-zero result for									
				in Survey Units 1 and 2 are			Bi-214, sample 6PB142S U2-018.									
		K-40 Character ization		represent ative of two different	One-minute static counts collected at each of the 16 systematic locations on		The Pb- 214 result was positive	t								
		and FSS box plot differ markedly;		soils, separate d by what was	02/08/2007 by J. Hubbard. Gamma static counts ranged between 2,535 and 4,607 counts per minute (cpm). "Characterization" gamma scan (100%)		at 0.23 pCi/g, but the Ra- 226 result									
		mean character ization activity is		defined in the FSSR as a second			was also negative. This occurren									
		abnormal ly low (1.68		subsurfac e structure.	of 6,092 cpm. Background rate was 5,400 cpm. "Final Status" gamma scan performed	All Final Systematic samples were collected on 02/07/2007. FSS	ce does not indicate									
		pCi/g) vs. FSS mean activity (7.94		ization samples were	and 6,000 cpm - less than background +3 sigma (σ) investigation level of 6,581	which were collected on 09/05/2006. Most FSS samples (14 of 16) were analyzed within 3 working days; the other two FSS samples were analyzed within 1 working day. Onsite and offsite	falsificati	i	Hubbard/ D Rosengat			"Characterization" gamma scan performed the day after sampling. "Final Status" gamma		performed the day after sampling. "Final Status" gamma scan also	Data quality issue for FSS samples with low activities for Bi-214, Pb-214 and Ac-228. "Characterization" gamm scan performed the day after sampling. "Final Status"	a Explain why gamma ' scans were conducted
142	SU 2	pCi/g).	NA	ization and final systemati	cpm. Background rate was 5,100 cpm.	Data were consistent.	was also samples had zero (0 pCi/g)		han	NA	1	scan also performed after sampling.	1	performed after sampling.	gamma scan also performed after sampling.	before sampling. Resample
				c samples collected in Survey			results for Bi- 214,									
				Units 1 and 2 are represent ative of	"Characterization" gamma scan (100%		samples 6PB142S U3-024 and									
				two different soils, separate	coverage) performed 09/06/2006 (the day after sampling) by J. Hubbard. Range was between 2,000 and 6,000 cpm – less than the investigation level		6PB142S U3-025. For sample									
				d by what was defined in the FSSR	of 6,092 cpm. Background rate was 5,400 cpm. "Final Status" gamma scan performed 02/08/2007 (the day after sampling) by		6PB142S U3-024, other radium-									
				as a second subsurfac	J. Hubbard. Range was between 4,900 and 6,000 cpm - less than the		series results were mixed;					"Final Status" gamma scan performed				
				structure. Character ization	was 5,100 cpm. One-minute static counts collected at each of the 22 systematic locations on 02/08/2007 by J. Hubbard. Gamma static counts	Most ESS camples (20 of 22) were analyzed within 2 working	the Pb- 214 result was 0.39	t	J Hubbard/			02/08/2007 (the day after sampling) by J. Hubbard. Range was between 4,900 and 6,000 cpm - less than the background +3 sigma (σ)		"Einal Status" gamma scan	Data quality issue for FSS samples low activities for Bi	Explain why the gamma scan was performed on 2/8/07 and FSS
142	SU 3	NA	NA	samples were collected several	ranged between 3,034 and 5,841 counts per minute (cpm).	Most FSS samples (20 of 22) were analyzed within 3 working days; the other two FSS samples were analyzed within 1 working day. Onsite and Offsite data were consistent	pCi/g, however the Ra-	1	Rosengat han	NA	1	investigation level of 6,581 cpm. Background rate was 5,100 cpm. All Final Systematic samples were collected on 02/07/2007.	1	"Final Status" gamma scan performed 02/08/2007 -the day after sampling.	214, Pb-214 and Ac-228. "Final Status" gamma scan performed after sampling.	
				rounds of soil excavate d. SU-5												
			Final Systemati c samples	had 20 FSS Samples, 6	Scan measurements were taken on		Four out of 20 gamma spec									Explain why soil sample 19157-S0005 was
			indicate the potential for at	remedial action biased samples,	01/06/2010, with 700 total readings taken. None of the reading exceeded an investigation level (3 sigma, based on a background area average). Static		reports for FSS samples had									counted out of sequence and four out of the 20 gamma spec reports for FSS samples
			least two different data	and 20 systemati c	measurements were taken on three different dates – 01/06/2010, 01/29/2010, and 3/04/2010. No		deviation between sample		No Scan/Stat	No Scan/Stat		Sample 19157-S0005-F198-01 was counted out of sequence and 1 working day after all other FSS samples. Four out of 20 gamma space reports for FSS samples had deviations				had deviations between sample count date and report date.
157	SU 5		ns for Bi- 214 and K 40.	character ization - samples collected.	measurements exceeded the investigation level (3 sigma). The scan measurements do show correlation to the static measurements	Data for comparison is limited since only two samples were sent to the offsite laboratory for analysis.	count date and report date.	0	Name	Surveyor Name Provided	1	spec reports for FSS samples had deviations between sample count date and report date. Static readings were collected over a period of three months.	0	NA	NA	Also why static reading were collected over a period of three months. Resample
			Final												Ten out of 20 gamma spec reports for FSS samples had deviations between sample count start time and the analysis time when the gamma report was generated.	
			Systemati c samples indicate the		Scan measurements were taken on 03/11/2010, with 1,631 total readings										Six samples (234, 235, 238, 245, 246, and 251) were counted on 03/12/2010, but the gamma reports were generated on 03/15/2010. These reports appear to have been reviewed and had replacement reports	5
			potential for at least two different		taken. None of the reading exceeded an investigation level (3 sigma, based on a background area average). Static measurements were taken on										generated after making a minor correction. Samples 240, 243, 249, and 250 were counted on 03/12/2010 and 03/15/2010, but the gamma reports were not generated until 04/21/2010 and 04/22/2010. There is	Explain the delay in
			data populatio ns for Bi-	of excavatio n, no bias samples	03/11/2010 at each sampling location associated with the FSS samples, resulting in 19 measurements. No measurements exceeded the				No Static/Sur veyor Name	No Static/Sur veyor Name					no discussion of why the reports were generated 45 days after the samples were counted, or what change were made, if any. The results do not appear to be different from other sample results where the gamma	reports after 3-45 days s after the samples were counted. Also explain
157	SU 7	NA	40	collected	investigation level (3 sigma).	Data for comparison is limited.	NA	NA		Provided	0	NA	0	NA	reports were generated at the end of the sample coun	